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1890.—OTTAWA, JANUARY—1890.

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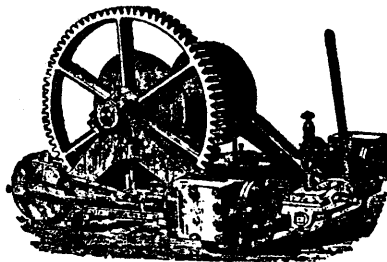
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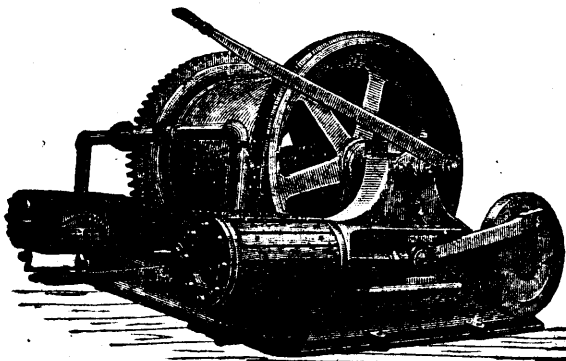
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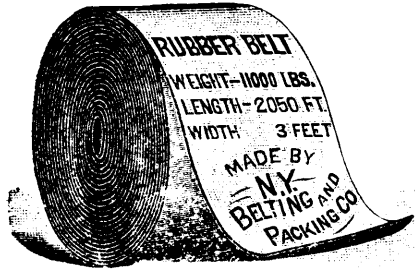
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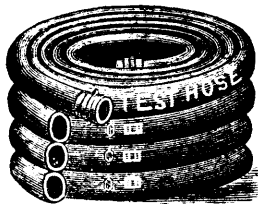


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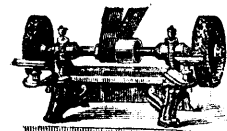
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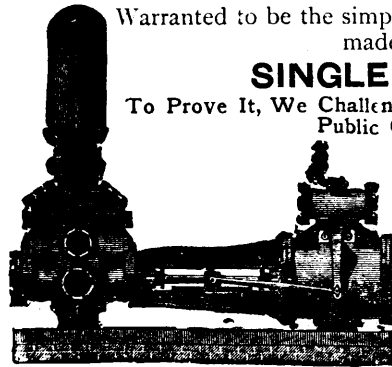
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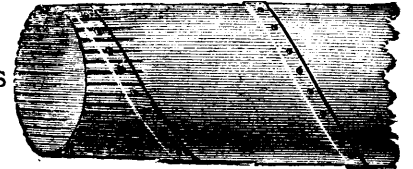
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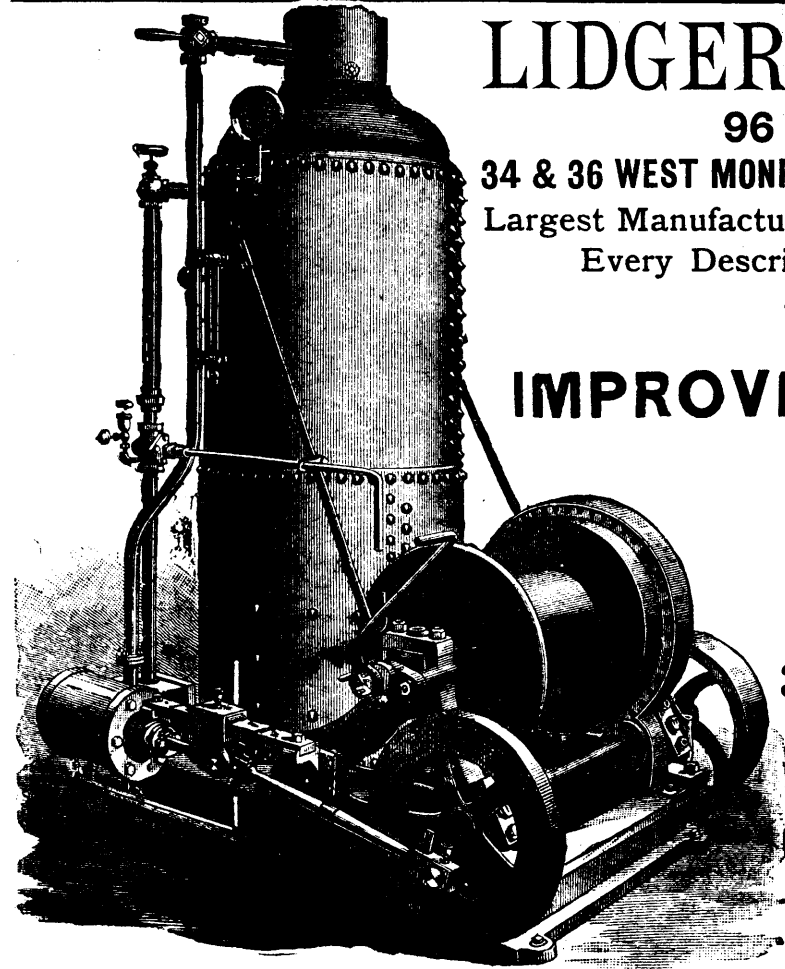
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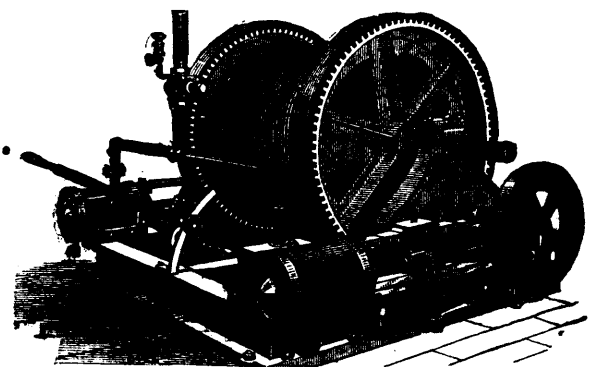
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The following summary of the principal provisions of the General Mining Act of the Province of Ontario is published for the information of those interested in mining matters in the Algoma District, and that part of the Nipissing District north of the Mattawan River, Lake Nipissing and French River.

Any person or persons may explore for mines or minerals on any Crown Lands surveyed or unsurveyed, not marked or staked out or occupied.

The price of all lands sold as mining locations or as lots in surveyed townships is two dollars per acre cash, the pine timber being reserved to the Crown. Patentees or those claiming under them may cut and use such trees as may be necessary for building, fencing or fuel, or for any other purpose essential to the working of mines.

Mining locations in unsurveyed territory shall be rectangular in shape, and the bearings of the outlines thereof shall be due north and south, and due east and west astronomically, and such locations shall be one of the following dimensions, viz: eighty chains in length by forty chains in width, containing 320 acres, or forty chains square, containing 160 acres, or forty chains in length by twenty chains in width, containing 80 acres.

All such locations must be surveyed by a Provincial Land Surveyor, and be connected with some known point or boundary at the cost of the applicant, who must file with application surveyor's plan, field notes and description of location applied for.

In all patents for mining locations a reservation of five per cent. of the acreage is made for roads.

Lands patented under the Mining Act are free from all royalties or duties in respect to any ores or minerals thereon, and no reservation or exception of any mineral is made in the patents.

Lands situated south of the Mattawan River, Lake Nipissing and French River are sold under the Mining Act at one dollar per acre cash.

Affidavits showing no adverse occupation, improvement or claim should accompany applications to purchase.

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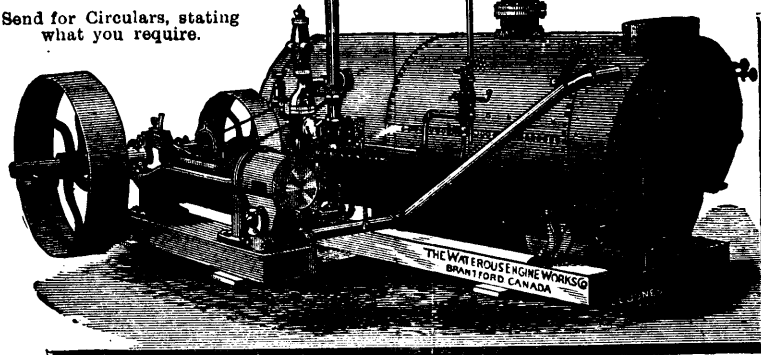
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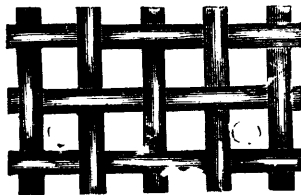
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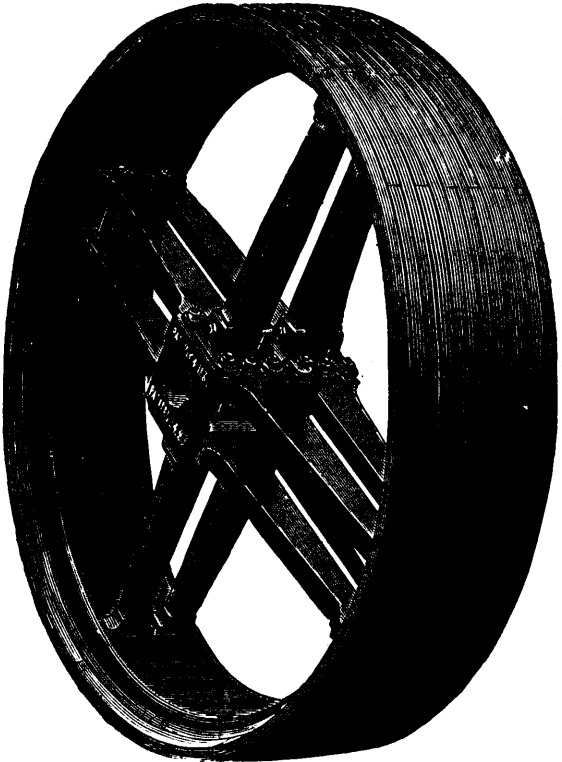
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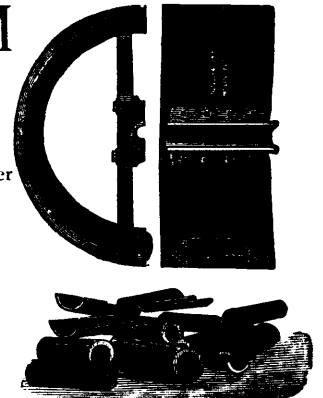
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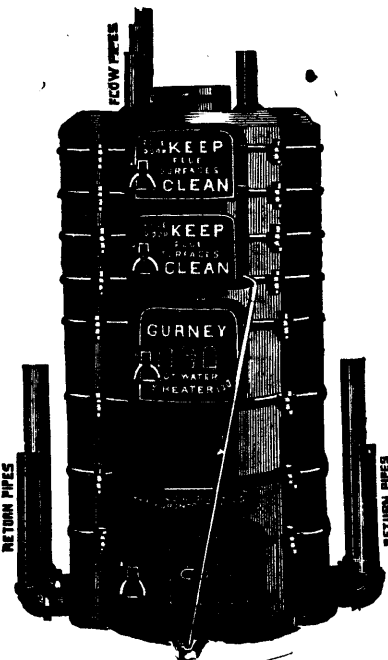
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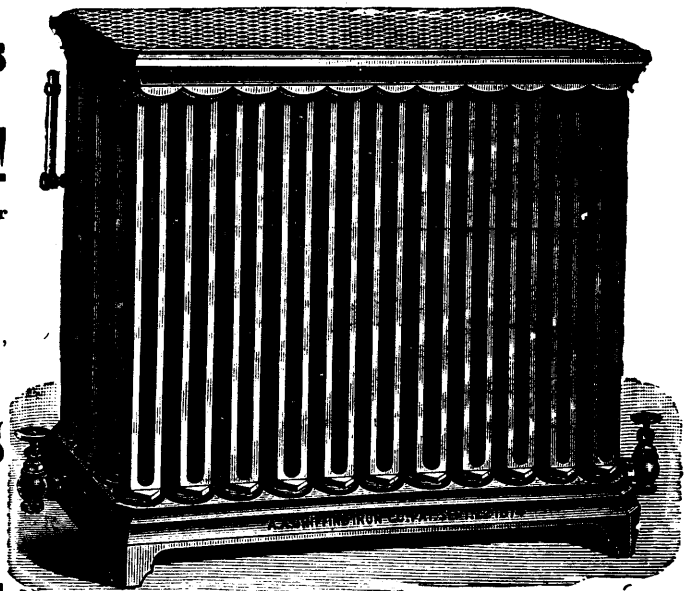
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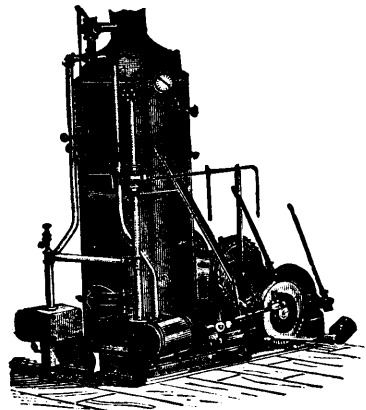
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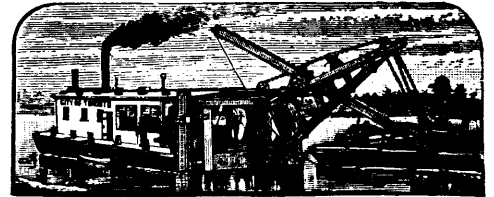
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MINING REVIEW

Established 1882

THE OFFICIAL ORGAN OF THE GOLD MINERS' ASSOCIATION OF NOVA SCOTIA, AND THE REPRESENTATIVE EXPONENT OF THE CANADIAN MINERAL AND MINING INDUSTRIES.

ESTABLISHED 1882.

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The Canadian Mining Review

CONDUCTED BY B. T. A. BELL

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UNION CHAMBERS, 14 Metcalfe St.
OTTAWA.

Vol. IX. JANUARY, 1889. No. 1.

Mining as an Investment.

There is perhaps no better time to call attention to the value of mines as investments than at the beginning of a new year, when men's minds are yet occupied with the profits and losses of the year just closed. In many ways the year 1889 was a notable one for Canada in the way of mineral development. The development of the large copper and nickel mines at Sudbury, and the highly successful campaign of the large blast furnaces there have given evidence of what skill and capital combined can do to make mining a safe and lucrative investment. The increased activity in the Port Arthur silver region, the large shipments from the phosphate country, the increased production of the gold fields of Nova Scotia, together with the many incorporated schemes looking to the development of our large iron deposits have drawn many eyes and turned many minds to the consideration of the value of mines and metallurgical works as a source for profitable investments.

In the United States the past year has been a very prosperous one for the mineral industries. We have taken a list of thirty-one prominent mines in that country, whose shares are openly dealt in upon the market, and therefore whose records are open and available, and the results, summarized are as follows:—

Total share or nominal capital of 31 companies	\$158,955,000
Total market value of capital of 31 companies	78,111,000
Total dividends paid in 1889 upon above capital	9,472,000
Total dividends paid to date by 31 companies	88,457,145

These figures show that the actual value of the mines as deduced from the daily quotations in open market was 50% of the nominal capital. Also that the dividends paid last year realized 12% on the market value, or about 6% on the share value. Furthermore that that these thirty-one mining companies had paid in dividends since their inception 113% on their present value, or nearly 60% on their nominal share capital.

Such figures as these are the best answer to the statements so frequently made that "to put money into mines is to gamble." Mining is a legitimate business when it is conducted in the same manner and on the same principle as other legitimate businesses, and its profits often are very much greater.

That mines are but too frequently made to serve the purpose of unsuccessful speculators is unfortunately true, but the victims are to a large extent responsible for being thus deceived, as it is not at all an impossible thing to deter-

mine the actual present value of a mine—a mine has no mystery necessarily. Now a days there is a sufficiency of honest and competent mining experts who can and will give an honest and reliable valuation of any mining property that may be offered to investors, and it is only upon such demonstrated value that an investment should be made; what the promoter thinks likely or possible, or *believes* will be found afterwards, in depth, or in the future, offers a foundation for nothing but gambling.

Were the same principles of ordinary business prudence used in making investments in mines that are used (by the same investors it may be) in making investments in real estate, railroad securities, or bank stocks, there would be fewer failures and a very different moral feeling towards mining and those engaged therein.

To make mining profitable as an investment then (1) the price paid for the property must be proportioned to its actual demonstrated value, as determined by an honest and competent expert; (2) an amount of working capital sufficient to put the property upon a self-sustaining basis must be supplied; (3) the person or persons entrusted with the management must be honest, skilful, and last, but by no means least, economical.

Profits coming from the legitimate working of mines benefit the industry by inducing further investments of capital, but the speculator who sells a prospect for ten or a hundred times its value, is no benefactor.

It is only by making mining profitable to those whose money is invested in the *actual working of the mines* that a healthy and legitimate growth of the mining industry can be attained.

The Mining Industry of Nova Scotia in 1889.

The year 1889 was a very prosperous one for the mining interests of Nova Scotia. The coal iron and gold mines were all active and labor was in demand. The total output of coal for the province was in round numbers, 1,760,000 tons, and the shipments aggregated 1,560,000 tons against 1,576,691 tons in 1888. This decrease of 16,500 tons is but little more than 1% of the sales, and is trifling, and the year shows an advance of nearly 3% over 1887 and 12% over 1886. The decrease of 16,500 tons is principally from Pictou, three mines there (the Drummond, Albion and Vale) aggregating a decrease of 46,000 tons. Cumberland county almost held its own, both Springhill and Chignecto collieries showing an increase, but the Joggins has a large falling off of over 5,000 tons. The increase in Cape Breton is remarkable in two mines, the International and Victoria, the two aggregating an increase of 40,000 tons; all the other Cape Breton collieries, excepting Bridgeport, report decreased sales.

The yield of gold in round numbers was 25,000 ounces, an increase of 2,500 ounces over

1888, and, with the exception of the three years, 1865-6-7, the largest product of any year since discovery. It was confidently expected in July that the year's yield would exceed any year in the history of the province, as the product for the first six months was 13,623 ounces, but the sudden falling off of the yield in the Caribou and North Brookfield districts, coupled with the transfer of the Central Rawden property in September, make the yield for the second six months less than 12,000 ounces. The new management at Central Rawdon wisely curtailed production until the mine was put in shape to handle the ore more economically. Some of the older districts have fallen off during the year, due probably to the inevitable lean spots which occur in the history of every paying lode, among these are Salmon River, Oxford and Caribou. Rawdon has not been a producer during the year.

There were five districts having a production exceeding 2,000 ounces, viz:—Molega, 2 producing mines, Oldham, 1 mine, Whiteburn, 2 mines, Central Rawdon, 1 mine, Salmon River, 1 mine; and the aggregate of their production will exceed \$250,000, or more than one-half of the total yield.

The outlook for this present year is very bright. Central Rawdon, Molega, Whiteburn, Oxford, and Salmon River will be steady and heavy producers. Sherbrooke and Mt. Uniacke will exceed last year's record, and Chester Basin is expected to be a regular producer. North Brookfield and Oldham will probably show a decrease, and perhaps also Stormont. Montagu is uncertain, but will probably increase its production.

The iron industry received quite an impetus during 1889 through the various schemes which were set on foot to develop the resources of the East River of Pictou. The Nova Scotia Coal, Iron and Railway Co. had a force of miners at work in the latter part of the year developing one of the deposits leased by them, and considerable ore of good quality has been mined.

Another company, called the Nova Scotia Midland Iron and Railway Co. has commenced to build a railroad from its property to New Glasgow, a distance about 18 miles.

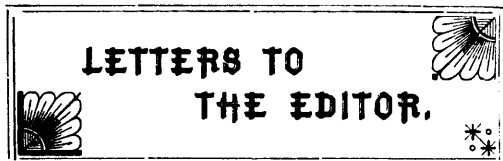
The output of the Londonderry mines is not known at date of writing, but the works have been kept busy all the year, and have had a big run on contracts to supply cast iron pipes. The mines are heavily handicapped by the heavy expense entailed in timbering, but it is confidently asserted that the new company and new management will bring up the industry to its proper position.

The re-adjustment of prices for copper, consequent upon the collapse of the French Syndicate, has been steadied, and has brought up the price again to a point at which the Coxheath mines in Cape Breton can probably produce at a profit.

The minor industries of Antimony and Manganese were not in a flourishing condition last year; the sudden and abnormal rise in antimony may however stimulate the owners of the Gore property into reviving the work at their undoubtedly valuable property.

British Investments in 1889.

During last year there were registered in England 2,560 new companies involving a total capital of £222,653,000 sterling. These figures show an increase of 70 new companies, but a decrease in capitalization of £123,061,000 sterling compared with 1888. It would appear, therefore, that the past year has been prolific in small enterprises, due, no doubt, to the rapid conversion of small private concerns into joint stock companies. Of the above companies it is interesting to observe that 370, with a capital of £35,000,000, were mining undertakings.



Phosphate Analysis.

New Broad Street House, London, Eng.,
20th Dec., 1889.

The Editor,

SIR,—I have read with a considerable amount of interest the letter of my friend Captain Adams which appeared, under the above heading, in your November issue, and none the less so that I had only a short time previously met with the Report of the British Consul for Rochelle, which in part relates to the English trade in fertilizers with France. Naturally looking at the matter from a different point of view, it yet appears in no degree surprising that, under the circumstances, the Consul should arrive at the conclusion that if such measures as those advocated by Captain Adams are not adopted by the manufacturers in England, their continental trade, which is one of immense importance, will be irrevocably lost.

The Consul, after speaking of the immense proportions and growing importance of the trade in fertilizers, states that whilst English manufacturers have hitherto had a practical monopoly of the trade, they are now rapidly losing it, if they have not already lost it; and that this untoward result is brought about solely by the unwillingness evinced by them to take steps for adapting the trade to the requirements of their continental customers. Firms in France, prompt to avail themselves of the opportunity, have already established large factories there, with the view of acquiring the trade for themselves and carrying it on in their own country. The Consul states that the causes of a state of things, so prejudicial to English interests, having been enquired into by him, may thus be shortly stated.

The English manufacturers, he states, have have lost the continental market because they have failed to adapt the trade to suit the local demands. Thus, for instance, they will not sell at a fixed strength, but quote their superphosphate at an uncertain price, say from 5s. to 6s. for an uncertain strength from 10 to 12 degrees. The strength, consequently, has to be tested

after it arrives, to ascertain the number of degrees; the price being then fixed accordingly. By this method of doing business the buyer is compelled at one time to take it at a higher price, and at another at a lower according to the results of the analysis. This the French farmers most strongly object to; they require to buy at a fixed degree so that they may know exactly what they are getting for the money they pay. He further considers it most undesirable that importers should have to manipulate the fertilizers after receiving them, which at present they are obliged to do in order to meet the requirements of their customers, the farmers; on the contrary, he insists upon it, that the fertilizers should always be sold exactly as received from the wholesale houses; because, when the proportions are altered subsequently, a tempting opportunity is given for adulteration, and the natural result follows that the goods dealt in acquire a bad name.

It appears to be universally admitted that a better article than that supplied from England does not exist; consequently, the Consul is of opinion that good business even yet may be done if only the English firms will sell at a moderate price, and study, more than they have at present evinced a willingness to do, the want and expressed wishes of their foreign customers.

Englishmen, as we know, are somewhat unwilling to travel out of old grooves, but in face of so serious a state of things as that disclosed in the Consular report, manufacturers will not be slow to perceive the absolute necessity of changing their system, in order to prevent the foreign trade slipping entirely through their fingers.

In any case it is clear that the time is now ripe for a change; consequently the opportune moment has arrived for the Canadian producers to unite in urging the adoption of their views upon the general body of manufacturers here; and as their views, as set forth by Captain Adams, seem to be based on justice, it is only to be expected that they will be fairly considered by the manufacturers, and as far as possible be given effect to in the alterations of the methods of doing business which seem to be now inevitable.

Yours etc.,
ROBERT H. JONES.

Buckingham, Que.,
13th Jan., 1890.

The Editor,

SIR,—We have perused Mr. Adams' grievances and his suggestions for remedying his unhappy experiences in disposing of his apatite ore, but we are not inclined to admit that the practices of well known brokers and dealers are so corrupt, or chemical analysis so intentionally elastic as a casual reader of these statements might be led to suppose.

We desire here, however, to only refer to the technical operations, the commercial dealings offering no difficulty to any competent man of business.

We presume therefore that the parcel of phosphate to be analysed has been correctly and methodically sampled, so that the sample really represents the ore in question; this result is no easy matter to obtain from the average product of our local mines, consisting of lumps and powdered debris, which are invariably of different degrees of richness, and when we take into account the rough and ready means employed, we may well marvel at so near an agreement of results as is usually obtained. It may also

surprise some readers to learn that we know of only one mine in this region which possesses any decent mechanical necessities for reducing and preparing their samples, and no mine possesses a chemical laboratory by which controlling analyses could be effected, thus rendering invaluable guidance for timely classification, by which subsequent disappointment might be avoided.

Now before comparing the results of analyses obtained by two or more chemists, we must first assure ourselves that the samples sent or subjected to analysis, are absolutely identical and homogeneous, and when this condition has been obtained, another cause of divergence in the analyses may creep in, if it has not been stipulated that the same method of analyses be adopted by the respective chemists.

These differences of analytical results have been recognized long ago in various commercial branches, to arise from the different methods of analysis employed on the same sample, and not to be attributable to any inconstancy of chemical reactions or even to faults of manipulation on the part of the operator. The analysis of such valuable manurial products as potash, nitrogen (ammonia) and phosphoric acid have undeniably figured very prominently as a cause of these complaints, until associations and chambers of commerce have led the way to agree upon and impose one particular method of analysis to be applied to these commercial samples. Thus the syndicated mining companies of the Somme phosphate (which is a high grade) have long imposed that the analysis guaranteed by them refer to the result obtained by Maret's method of analysis, both for phosphoric acid and for the contaminating ingredients of oxide of iron and alumina.

As we have strongly deprecated the rough rule-of-thumb systems existing in the mining operations in the Ottawa County, we hope to soon see a change for the better, and with this end in view it may be acceptable to some of your readers to here describe a method of phosphate analysis suitable for our Canadian apatite, and which is at the same time rapid, simple and trustworthy when carried out in accordance with the prescribed details. It is the method much employed in France, and generally known as Maret's method above referred to.

The whole of the sample is rendered sufficiently fine to pass through a sieve of 80 meshes to the linear inch, and then intimately mixed. The solutions of fixed strength are thus prepared:—

1. *Ammonical Citrate Ammonia*.—Dissolve 400 grammes of crystallised citric acid in liquid ammonia, .880 and complete volume to the litre.

Ammonical Solution of Chloride of Magnesium and Chloride of Ammonium.—Dissolve 8 grammes of carbonate of magnesia in quantum sufficit of hydrochloric acid; add 120 grammes of chloride of ammonium; render slightly alkaline by liquid ammonia; add excess of ammonia 200 centimetre-cubes, and water to complete volume of one litre; finally allow to stand a few days and filter before use.

3. *Wash-Water*.—Distilled water 800 cent.-cubes, ammonia 200 cent.-cubes, and chloride ammonium 5 grammes.

Analysis.—One gramme of the sample is weighed with a porcelain evaporating basin; 10 cent.-cubes of concentrated hydrochloric acid added, and then set to digest about ten minutes on the water bath; now add 20 cent.-cubes of water and allow to evaporate to perfect dryness. The dried residue is taken up with 30

cent.-cubes of dilute hydrochloric acid (containing $\frac{1}{3}$ part of concentrated acid) digested during ten minutes more on the water bath and subsequently filtered. The filtrate is received in a conical foot glass, the paper filter and porcelain basin being sufficiently washed with distilled water. Now add to the filtered liquid with washings, 50 cent.-cubes of the alkaline citrate of ammonia solution (1); 60 cent.-cubes of strong liquid ammonia (.880); and 10 cent.-cubes of the alkaline chloride of magnesium. The total volume of the liquid for precipitation being about 350 cent.-cubes; it is gently stirred for a few minutes and afterwards allowed to stand for at least twelve hours. The precipitated ammoniac-magnesian phosphate is collected on a filter, employing a feather to detach the adhering deposit in the precipitating glass. The ammoniac wash water (3) is used for this washing, which should be effected in five rejections, taking the precaution to allow the filter to drain each time before proceeding to a fresh washing. The filter and its contents are allowed to drain, and partially dried is removed to a weighed platinum crucible or capsule and completely dried in the air bath. It is then slowly heated to dark red, and finally to a white heat, or until the calcined pyrophosphate of magnesia becomes absolutely white. After cooling it is weighed, and the known weight of the filter ash deducted, together with the tare of the crucible. This product multiplied by 63.96 gives the percentage of phosphoric acid in the sample, and the result of phosphoric acid multiplied by 2.183 gives the equivalent percentage of "bone phosphate," or tribasic phosphate of lime.

We have thoroughly tested this process ourselves, and find it reliable and expeditious, and we have thought it useful to describe it, because we have never seen it mentioned in any of the ordinary analytical text books.

On a future occasion we will also describe the Maret method of estimating the oxide of iron and alumina in mineral phosphates, which may have an interest for some of our local miners.

I am, etc.,

J. LAINSON-WILLS.

The Smelting Works at Golden, B. C.

CALGARY, 9th Jan., 1890.

The Editor,

THE CANADIAN MINING REVIEW.

DEAR SIR.—In the December number of your Review, under the above heading, you state that there is some talk of erecting another smelter in Kootenay, so located to suit the mines at Golden and Donald, and that Mr. McCarthy of Calgary was the moving spirit. As I am, no doubt, the person referred to, I take pleasure in giving you the particulars of the report which has reached you, and confirm same. Although considerable has been done by those associated with me, we have not, and do not now wish to make any statements but that which we are confident will be borne out by our future actions, as nothing is more detrimental to the interests of those engaged in mining or in mining enterprises, than spreading reports wholly foundationless, or made with the interest of working up a mining boom in any particular locality. I know of no industry which is more injured than the mining industry by false reports sent out evidently by those who have the sole object in view I have mentioned, and I attribute to this more than any other cause, the want of faith which the public are liable to have in anything connected with mining. What I herein state may be relied on. In the spring of 1888 H. B. Alexander of Alberta, John L. Bowen, James A.

Lougheed and myself formed a partnership for the purpose of erecting smelting works at Field, on the line of the C. P. R. in British Columbia, and purchased two mining locations at Mount Stephen near that place. In May, 1888, we went to Chicago and purchased from Messrs. Fraser & Chalmers a 40 ton smelter, an ore breaker, a pair of rolls, iron for reverberatory furnace, and in fact everything requisite for a complete plant, except engine and boiler which we intended purchasing in Canada; all this plant has been paid for and has been ready for shipment for some months. In August last we engaged S. S. Fowler, M. E. of Chicago, to erect and superintend our works, and for that purpose he came on; but after examining our proposed site at Field, and visiting Golden on the Columbia River, he advised us to locate our works at Golden, 33 miles west of Field, if a proper site could be obtained at that place. The Dominion Government, in order to encourage smelting operations in British Columbia, gave our firm a tract of land near Field, and in order to procure a transfer of the grant of land at Golden, we were forced to delay the erection of our smelter until that grant would be obtained. This the Government has now given us, and we have obtained 320 acres of land at Golden on the condition that we erect our smelting plant at that place, which we will as soon as spring opens. You will see by this that the report which has reached you has substantial backing. All our plant, with the exception of engine and boiler has been purchased and paid for, and the smelter will be erected as mentioned. I have personally been interested in the mines in British Columbia for several years, and will in another letter give some reliable information in respect to the development now going on in the Kootenay District in that province, which I hope may be interesting to some of your readers.

Yours etc.,

P. MCCARTHY.



In General.

Many Canadian phosphate schemes are now on the move in London. The Phosphate Trust (Ld.) with £1,000,000 capital referred to in our last issue is expected to come out publicly this month. This company has included in its prospectus large areas over which the promoters have as yet no control, but which, it appears, they would purchase if their appeal for capital is successful. Another large and similar enterprise is also spoken of as being in preparation, and we shall be interested to see if the English public have become aroused to the advisability of phosphate investments in Canada.

London letters state that Col. North's nitrate enterprises are languishing, and his followers are beginning to lose money. It is said he is sustaining their spirits by promises of fortunes in phosphate, and it is thought his attention may be turned to Canada as a field for operations.

A strong firm in London are endeavouring to organize an undertaking for the manufacture of super-phosphate at Buckingham, in connection with the North Star Mine and other Lievre

river properties as the source of supply for phosphate. The sulphuric acid is to be obtained from Capelton.

We are indebted to the thoughtfulness of Mr. W. H. Hutchinson, of the Anglo Continental Guano Works, London, Eng., for a number of samples of foreign phosphates for the *Review's* museum. These consists of

Bull River phosphate.....	55/60%
West Indian ".....	60%
Lahn ".....	40/50%
Sombrero ".....	75%
Welsh ".....	50%
Basic Slag.....	40%

The same gentleman writes *apropos* of the discussion upon the alleged discrepancies between the buyers' and sellers' chemists in the analysis of Canadian phosphate:—"I have just been looking up the analysis of some parcels of Canadian phosphate bought by us. The buyers' and sellers' analysis are:—

For Buyer.	For Seller.
83.94.....	84.48
72.39.....	73.45
80.69.....	81.54
75.40.....	75.96
86.60.....	86.87

from which you will see there was no great difference—not any like the discrepancy alluded to by Captain Adams."

The total production of South Carolina phosphate for the year 1889 is estimated to have been 423,720 tons.

The phosphate beds belonging to the State of South Carolina are valued at \$7,000,000. The State debt of \$6,000,000 is about to be refunded at 4 per cent., and it is proposed to sell the phosphate deposits and wipe out the debt at once. A bill to authorize the Comptroller General to advertise the beds for sale has been favorably reported by the Ways and Means Committee of the House of Representatives, which, it is thought, will pass, despite the strong opposition from the phosphate interests of Charleston. The advocates of the bill figure that the State would save \$8,000,000, so far as the State debt and interest thereon is concerned, by cancelling the debt with the proceeds obtained from an immediate sale of the phosphate deposits. For, assuming the beds to last for fifty years, the State's royalty would amount to \$11,250,000; but interest on the debt for the same time would amount to \$12,000,000. The principal, too, would become due, and the excess above the royalty would be upwards of \$8,000,000. A great advantage which the purchasers of the beds would have would be their ability to fix the royalty at any figure they might see fit. The State royalty is \$1 per ton. The phosphate business of Charleston involves many millions of dollars, and the proposed legislation will no doubt be vigorously resisted.

For the following particulars regarding the new fertilizing works now being operated by Messrs. G. H. Nichols & Co., at Capelton, we are indebted to the courtesy of Mr. H. W. Wigglesworth, who in a recent letter says:—"Our fertilizing works are now in full swing preparing for the coming season's demand. Here, in the Eastern Townships, little trouble is anticipated, our last year's start and the very satisfactory results obtained having given quite an impetus to our business locally. In Ontario, where we did little last season owing to the limited time left at our disposal, we look for a large demand for our product,

our travellers reporting most encouragingly of the prospects. In fitting up the works, with our extensive experience in the States to guide us, we have put in a plant, which, if it can be equalled can certainly not be surpassed on this continent. For breaking the mineral phosphate the Blake crusher is used, this machine, as is well known, doing its work quickly and effectively. From the crusher the apatite is carried by elevators to a hopper which feeds the new Griffin mill. This mill is worked on entirely new principles, and grinds from 25 to 30 tons a day, discharging it screened and ready to be conveyed and elevated to the dissolving floor; and it does its work so finely that much of the difficulty in dissolving is overcome. The acid treatment, of course, depends very largely on the analysis of the ore, and upon definite chemical proportions; our success in reducing to a minimum the insoluble phosphate has been very gratifying, and must prove a great boon to the consumer. At present we are about to add to the Chemical Works a new set of chambers in order to insure an unstinted supply of sulphuric acid for the Fertilizer department. For mixing the raw material and grinding the superphosphate we have put in a Walker & Elliott Disintegrator, a machine which is now being very largely adopted in the Southern States to replace Carr's disintegrator. It revolves at the rate of 720 revolutions to the minute, pulverising by a sort of tearing action. The various raw materials are fed directly and only require passing through and screening to be ready for bagging, and the market. The new Disintegrator should grind 100 tons per day. We have also an excellently equipped laboratory where all the raw material and finished grades are analysed, and by which we are enabled to detect any faulty manipulation before it gets too far. As you are aware the price of mineral phosphate has risen very considerably since the summer, but having been fortunate to secure a large supply before the advance, we are enabled to sell our different grades at as low a price as we did last year. The demand for fertilizers both in Europe and in this country gives us unbounded confidence in the future of this business in Canada."

The following circular letter, under date of 28th ult., is being freely distributed by the American agents of a London firm:

"We cannot help being amused at the innocent credulity of these Canadian property owners, who lend such a willing ear to every man-jack of a runner, who talks so glibly of a "cash purchaser" in London and a "cash deposit" to be had only for the asking, and who in all probability, has not enough money in his pocket to pay for a single night's lodging at a fourth-rate hash house. Cannot you, with all your American cuteness, invent some process whereby you can instil into the brains of these same Canadian property owners a knowledge of the fact that they are being deceived, tricked, bamboozled and made fools of by these runners, impecunious fellows, who, having heard of the formation of the Phosphate Trust, are resorting to every subterfuge, every fast and loose game, to secure options on properties which they will offer to the Trust at so enhanced a price that the properties will be thrown back on the owner's hands with every chance of their being sold, utterly lost. * * * Having been advised from your side that several London firms of good standing had representatives in Canada authorized to pay deposits upon and secure phosphate properties, we have taken the trouble to enquire of these firms as to the truth of such statements, and in every single instance

they emphatically assert that they have no representative in America, and that any person representing himself as such, is doing so without any authority from them.

Markets.

European advices report the market strong with an upward tendency. A rumour was current locally to the effect that contracts had been made at a higher figure than 1/4d. for 80%, but on enquiry we find that there is no truth in the matter. A London house owning mines on the Lievres River have offered some of their phosphate at 1/4d. without finding a buyer. A sale has been made at Hamburg at 1/3d. for 80%, which is equal to 1/2d. at London, and this may be considered the opening price of the season. The market is firm, but prices are to a large extent nominal, for the miners are holding out for higher figures than the manufacturers is willing to give just now.

Kingston District.

About 100 men are now working under Superintendent Harris at Capt. Boyd Smith's mines in this district. Pits are being operated at Eagle Lake, St. George's Lake and Silver Lake, at all of which phosphate in paying quantities is being raised. A brisk season is expected at these mines.

The *Financial Times*, London, under date of 18th ult., contains an interesting report of the meeting of the Foxton Phosphate Mining Co. After working for six months a dividend was declared at the rate of 20 per cent., per annum, and a reserve was carried forward. The pits continue to produce a regular output, and Messrs. Lomer, Rohr & Co. have now some 800 tons on hand. The average yield from this mine is over 80%. The working is also being extended to other "shows" on the property, and these are beginning to yield considerable quantities of ore.

Templeton District.

As foreshadowed in one of our recent issues, the Blackburn property has passed definitely into the hands of the East Templeton District Phosphate Mining Syndicate, limited, the capital of which has been subscribed privately. This syndicate intends to push matters with the greatest vigor. The company has started hauling their No. 1 phosphate to the river Blanche, and their No. 2 to Messrs. Lomer Rohr & Co.'s mill at Bassin-du-Lievres, which mill they intend to supply with about 1,500 tons of phosphate during the present winter. We should say that the new company has been registered with a capital of £6,000 sterling. We understand the property is to be paid for in the main by a system of royalties extending over several years, so that, it is expected, the mine will pay for itself out of its own profits.

We have also pleasure in stating that another new company has been registered in London under the name of the McLaurin Phosphate Mining Syndicate (Limited) with a capital of £20,000 sterling to acquire and work 1,800 acres of freehold mining lands in this district. These lands are most favorably located, and bear the reputation of being good mining properties. Operations will be begun immediately on Lot 7 in the 11th Range and Lot 10 in the 10th Range; both of these lots adjoin the well known Blackburn mine.

The management of both of these concerns is in the hands of Messrs. Lomer, Rohr & Co., the

well known shippers at Montreal, who have displayed so much energy and enterprise in the development of the Canadian phosphate trade.

Amid so many futile and inflated schemes we are glad to note some that are started upon a legitimate basis and have good prospects of success. Great benefit will result to the phosphate industry from some well conducted and profitable enterprises.

Lievres District.

The Anglo-Continental Guano Co. of London are now selecting a suitable manager for their recently acquired property adjacent to the Enderald. Their prospector, Hogan, reports most favorably of his further exploration of the Aetna Hill Lot, upon which a cobbing house has been erected. As soon as the manager reaches the mine actual operations will be begun on a large scale.

Mr. Lanson-Wills, who recently examined the workings so far done on the property of the Dominion Phosphate Co., Limited (of London) states that the ground is opening up very well in both pits. There are 30 hands at present employed, including the cobbers who started work after the New Year. The holidays have retarded the delivery of the new steam hoisting engine.

The exploratory works at the Central Lake mines are now restricted to the driving of the north adit level during the winter season. The past year's work has been very successful in establishing the value of this property. The output of some 350 tons of rich phosphate will be hauled out by a new winter road to the High Rock Landing.

Captain Williams has between 50 and 60 men working in the North Star pits. The yield of phosphate continues to be most satisfactory.

Mr. J. Lanson-Wills sailed for England by the Umbria on the 18th inst. Mr. Walter Pickford, manager of the High Rock mines, also left for London on the 4th per SS. Etruria. Among other Canadians interested in the phosphate trade now in London are:—Mr. J. Hilton Green, of Messrs. Wilson & Green, Montreal; Messrs. George Stewart, and E. B. Haycock, Ottawa; Mr. C. M. Pielsticker, of the Dominion Phosphate Co. (Limited), Buckingham, &c. We believe that Mr. S. P. Franchot, managing director of the Ottawa Mining Co., Buckingham, also leaves at an early date. With such a galaxy of talent in the field it will indeed be strange if we do not hear of some important transactions in Ottawa county mines and phosphate lands.

Mr. O. M. Harris, of Montreal, who has just returned from a visit to the pits of the Canadian Phosphate Company, reports very favorably of the work now going on there. Every preparation is being made for an active season.

During the past year considerable prospecting and development has been done on the Little Rapids mines with most gratifying results; these new workings have revealed large masses of apatite in paying quantities, and fully confirm the reports of the high value of this property as a producer of Canadian phosphate. A third shaft is now being sunk at a point about 500 yards west of shaft A, and in this a

rich and promising mass of ore of exceptional purity has been uncovered; the present depth of this shaft is now about 40 feet. Shaft A is 190 feet, and shaft B 210 feet deep, and all the levels are now in good ore. We understand that active operations are to be begun early in the spring.

The frequent freshets have been very annoying to mining operations on the river.

Captain Henwood has struck a good body of ore in the north workings of the Emerald.

Perth District.

Contract work continues with gratifying results at the pits of the Anglo-Canadian Company.

Wakefield District.

Messrs Seybold & Gibson, Ottawa, have recently purchased the Moore mine in this district for \$5,000 cash. The property consists of some two hundred acres, and is registered as the north half of lot 12 and the south half of lot 13, 1st range Wakefield. Small development work has been done and some phosphate shipped. The new owners will commence operations immediately.

MINING NOTES.

Nova Scotia.

In General.

The shipments of coal during the season of 1889 are reported to be somewhat less than the year previous. The figures being:—

Cumberland County Mines.....	418,932 tons.
Pictou County Mines.....	386,254 "
Cape Breton Mines.....	754,964 "
	1,560,150 "

or a decrease of 16,541 tons compared with the returns for 1888.

The Londonderry Iron company recently sent an agent to examine the deposit of red hematite occurring at Torbrook, near Wilmot. The bed is reported to be six feet in thickness, and to average 62 per cent. in metallic iron. It is understood that leases have been signed covering nearly two miles in length of the deposit.

Waverley.

On the 1st of Jan'y. the Lake View Mining Co. reported 900 feet of levels and crosscuts driven since July. All of this development work is at the 340 ft. level. In driving west a fault has been struck, and in crosscutting north along this fault several new lodes have been found which have never cropped to the surface. Some of these new lodes look very promising, being from three inches to 10 inches thick, and estimated by Mr. Hayward to be worth from \$15 to \$25 per ton.

In West Waverley one small lot of quartz from the Palgrave property has been crushed, which yielded at the rate of \$18 per ton. Only one battery of the mill has been run, the others not being in condition. A small force of men is kept continuously busy.

The Gue and Wilson property in West Waverley has been working during Dec. and Jan'y. The

shaft in the Union lode, having a depth of 240 feet, has been pumped out and cleaned up. It is the intention of the management to sink the shaft to a depth of 300 feet, and then open up the property by levels and crosscuts at that depth.

The crosscut tunnel under Laidlaw's Hill is progressing slowly, having now a total length of about 450 feet. The famous "Barrel Lode," which is the *raison d'etre* of this tunnel has not yet been reached.

Oldham District.

Work in this district is very dull, the tribute work last month being of a very unsatisfactory nature. The property of the Oldham Gold Co. is yet in the hands of the Receiver and is practically idle, only two men being employed.

Central Rawdon.

The mill at this mine started up again this month after being refitted with a new engine and new boiler; but Manager Willis expresses doubt as to how long the batteries will be able to run, and says a new mill is a necessity of a pressing kind. The old workings of the mine have largely had to be abandoned, and a new shaft has been started in the vein. The character of the country rock at this mine is different to that of the gold measure proper, being easily weathered, and swelling and shaling off upon exposure; these characteristics have necessitated extra precautions in timbering both old and new openings, and have made progress somewhat slow. From developments made, the manager predicts a prosperous future for the property.

Salmon River.

Mr. Geo. A. Leslie of Halifax has sold his one-eighth interest in this mine to Gardiner Gish and A. K. Archibald of Truro. It is reported that the mine is looking better in its central portion.

Stormont District.

The Palgrave Gold Mining Co. of Isaacs Harbor has employed J. E. Hardman, M. E. to furnish the design and plan for a new ten stamp mill, and a new hoisting and pumping gear, with engine and accessories. The mill and plant are to be erected upon Hurricane Island this spring if the plans are approved. The eastern portion of the company's property has recently had a thorough separate test of its value per ton. The results were exceedingly good, and add very considerably to the value of the mine.

Mt. Uniacke District.

The Phoenix Co., under the management of Mr. H. B. Prince, is giving the low grade ores of this district a very thorough test. From results obtained from Mr. Prince, it appears that

Gold Mining Supplies.

The principal depot in Nova Scotia, carrying the most complete assortment of first class goods, is

H. H. FULLER & CO'S,
41 to 45 Upper Water St., Halifax, N.S.

Our line comprises Explosives, Fuse, American and English Mill and Hammer Steel, Bar and Bolt Iron, Steel Wire Hoisting Rope, Hemp and Manilla Rope, Rubber and Leather Belting, Miners' Candles, Oils and Lamps, Miners' Tools, Machinists' Tools, Blacksmiths' Tools, and every requisite for the gold miner.

H. H. FULLER & CO.,
Halifax, N.S.

the total cost of mining and milling including incidental and general expenses does not exceed \$2 per ton. The ore belt worked has an average thickness of 8 feet, and will yield from four to six feet of crushing material. It is believed that is the lowest cost per ton ever attained by any gold mine in the province.

Whiteburn District.

The McGuire mine at this place closed down indefinitely in December. It is understood that some changes in surface plant will be made before resuming work. The Graves mine is working full time with a force of 60 men.

Killag District.

Mr. Geo. W. Stuart has been busy this month removing his steam gear to the lode found in October, of which mention was made in the Review for November. As soon as the surface plant is ready mining operations will be resumed.

Renfrew District.

Mining matters here are very quiet. Both the Empress Co. and the Free Claim Co. have but half a dozen men, or thereabouts, each employed. It is understood that both properties are not looking so well as in the summer.

Pictou County.

During recent years the Acadia mines have greatly increased their production, and the past year has been no exception. The yield for 1889 shows an advance of 5,867 tons over last year, the returns given being 101,018 tons as against 95,151 tons in 1888. With a new hoisting plant and other facilities recently added, the prospects are good for a larger output during the present year.

Although there has been an increase in the sales of coke, the exports of coal from the Albion are still sadly in arrear, but it is hoped that the worst period in the history of this unfortunate mine is now passed, and that henceforth there will be a notable improvement in production. The shipments for 1889 are 52,668 tons against 64,388 tons during 1888, a decrease of 11,720 tons. The coke sales amounted to 15,839 tons.

Notwithstanding the small force at work in the pits, the production from Black Diamond shows a healthy advance on the previous year's operations. 1889, 32,416 tons; 1888, 23,686 tons; increase 3,700 tons.

The development of the iron deposits of Pictou county promises to be an immense industry. There are two companies about commencing work. One is American, and the other provincial and British capital. The American company has surveyed a road from their works to New Glasgow, some 18½ miles. They claim 40 square miles of iron and coal property. It is their intention to erect blast furnaces only, the ore being converted by this process into pig iron. The works in connection with the blast furnaces will cost about £40,000. Should a subsidy be granted, the company say they will extend the line to the sea coast. It is the intention of the local company to erect blasting and smelting works. The iron works at New Glasgow will take a great part of the output of the latter. It is believed that the part of the country in which these mines are located will become a second Pittsburgh.

We are glad to learn that the prospects of recovering the Foord pit are growing brighter. Explorations have been made a distance of over 150 feet on the north level, and the look of

things encourage the belief that it will pay to continue clearing up. Eight boxes of coal standing in the level were found only slightly charred. Since writing the foregoing we rejoice to hear that on Monday night the workmen proceeded half a mile on the level finding everything in excellent condition, the rails unmoved, etc.—*Stellarton Journal*.

Cumberland County.

The Springhill collieries have exported about 2,000 tons more than in 1888, the total export being 366,000 tons against 264,036 during 1888. In the early part of the year but little work was done at the pits, but during the last three months there has been great activity which is likely to continue for some time.

An improvement is noticeable in the yield from the Chignecto Pits, the figures for 1889 being 13,645 tons, as against 10,910 tons during 1888, an increase of 2,735 tons. Had there not been a scarcity of cutters more coal would have been sold.

The returns from the Joggin's collieries show a falling off of 5,316 tons compared with 1888, the figures being 37,937 tons. This is not owing to any decrease in the demand for the coal, but simply from a failure to start the leading places in time, thus creating a scarcity of pit room. The works are now in a better position than ever before, and there is good reason to believe that the production during the present year will be largely in excess of the season just closed.

Cape Breton.

Although handicapped by the want of a railway and shipping place of its own, Bridgeport again has a slight increase.

There is little difference in the returns from the Caledonia compared with last year, the figures being:—1889, 102,525 tons; 1888, 102,931 tons; decrease, 400 tons.

The Gowrie mines show a decrease of 8,127 tons; of round there were shipped 83,572 tons, and of slack 16,573 tons. The total export for the year was 100,145 tons.

The International has been by far the most productive of the Cape Breton mines, and shows an increase of 23,419 tons over 1888. The total shipments were 113,063 tons, of which 95,707 tons were round coal, and 27,358 tons, slack. Work was steady in all the pits and fair wages were earned.

At Little Glace Bay the output is 3,400 tons less than in 1888, the decrease being attributable to an increase in the rate of freight, on account of which the full quantity of coal ordered at the beginning of the season was not called for. The returns are:—1889, 74,000 tons; 1888, 77,405 tons.

The coal from the Sydney mines is largely used for domestic purposes, and the shipments, therefore, vary little from year to year. The exports for 1889 were 125,060 tons, or a slight decrease from 1888.

Excellent work was done at the Victoria mines, and the yield shows a strong lead over the previous year's operations. The total quantity was 88,900 tons, or 16,400 tons more than 1888; 6,900 tons of slack were shipped from these mines.

The quantity shipped from the Reserve mines comprises 925 tons round and 16,846 tons slack, a total of 106,771, as against 109,063 tons in 1888.

New Brunswick.

The Brunswick Manganese Company's stock has been admitted to the unlisted department of the Boston Stock Exchange. The property is located at St. Martins, in St. John county. Shares, \$40,000; capital, \$100,000; transfer office, 34 Oliver street, Boston. Herbert H. D. Pierce, president; George D. Hall, jr, treasurer, and they with James A. Tilden, W. R. Stockbridge and John A. Loring are directors.

Quebec.

The exports of Canadian asbestos for the fiscal year ended 30th June last are officially stated to have been —

	Tons.	Value.
No. 1 quality	4,228	\$304,336
No. 2 "	237½	11,192
No. 3 "	183	8,358
Total tons.....	4,648½	\$323,886

The following were the exports for the twelve months ended 31st December last, as per official returns received by us:—

	Lbs.
From Coleraine	249,400
" Black Lake	3,450,020
" Thetford Mines	8,166,360
" Broughton	16,000
" Levis	32,000

Lbs. 11,913,780

or 5,956 $\frac{17,800}{2000}$ tons. This is a most satisfactory increase over 1888.

Work continues lively at the pits of the American Asbestos Company, Limited, at Black Lake. Their No. 3 pit is in excellent condition, and never appeared as good as at present. The veins are all large and well bunched. Up to December they were working a force of about 80 men, though at present their force is not quite so large. In November they mined 96 tons of asbestos, and about 34 per cent. of this was No. 1. This is much higher than the average of Black Lake mines. The machinery of this company was only put in operation about July 28th, 1889, yet, notwithstanding this, they brought their output for year ending November 30th, up to 511 tons. Beginning December 1st, 1889, it will be known as a limited company. They are adding a number of houses for their workmen this winter.

Mr. A. Steele, Supt. Que. Central Ry., and Mr. John McDonald, of McDonald Bros., Sherbrooke, have leased a Lot on the opposite side of the lake from the above works. This will be known as the "Central Mine."

The United Asbestos Company, Limited, are putting in a plant of hoisting and air compressing machinery. The plant is built by the Jencke's Machine Company, of Sherbrooke, and from what we see of the machinery already on the ground it is a credit to that company. There are two 70 h.-p. steel boilers, duplex 7' x 10' "Bacon" hoist, and 16' x 24' Rand compressor. These will be put in position as soon as possible; the engine house is nearly completed, and it is expected that all the machinery will be ready for work in a few weeks. At present a force of about 35 men are employed. In a new opening now being worked there is an excellent showing of asbestos.

Southward mine,—Bell's Asbestos Company—is closed for the winter.

The Anglo-Canadian Asbestos Co. Lt., have reduced their force of men for the winter. They are opening a number of new pits, and if they show up well their output will be largely increased for the present year. We understand that Mr. R. T. Hopper intends adding some new machinery in the spring.

The Coleraine Mining Co has leased several lots of mining land to different parties.

Next to Johnston & Loomis, the St. Julie Mining Co. have taken a Lot. They are working a few men now, their work at present being entirely confined to prospecting their property.

Next to the above comes what is known as the Black Lake Mining Co. A few openings have been made on this Lot and some nice veins of asbestos uncovered.

The Laurier Mining Co. has acquired a Lot adjoining the Anglo-Canadian Asbestos Co. Lt. Very little work has been done as yet. They intend opening in the spring.

One or two other places have been leased by other parties, but no particulars can be obtained.

From the present outlook, we should say that the coming season will be the busiest that Black Lake has ever known. All the established mines are looking forward to a large year's work. Some of the mine managers are puzzling their heads over the labor question, as it is now, the men are scarce and most of the mines are short-handed. In the early spring the different companies will have to increase their forces by a considerable number, and it looks as if there will not be enough men to go around.

The American Asbestos Co. are getting a number of Belgian workmen out. Mr. E. Werthiem, Managing Director of this company, is expected to return in February.

The exports of copper ore from the Eustis and Capelton mines for the twelve months ended 31st December, as per our official returns, were 43,110 tons, and in addition to this there were shipped 1500 tons of copper matte. The shipments of ore and matte from the Harvey Hill mines during the same period has been very small, only some 255 tons having gone forward.

The value of the exports of Felspar from the Villeneuve mica mines for the quarter ended 31st ult. was \$487.50.

From the Bristol Iron Mines, during the same quarter, ore to the value of \$7,087.31, or 259½ tons, was shipped to the United States.

Ontario.

In General.

Notice of application for letters patent of incorporation has been published on behalf of the Gravel Bay Mining Company, the object being to work the Vulcan location, situated six miles north of Gravel Bay Station on the Canadian Pacific Railway. Five well-known gentlemen are the promoters, namely: Hugh Wilson, P.L.S., Mount Forest; Judge Kingsmill, Bruce; F. T. Sibley, formerly of the Silver Islet Company; W. E. Price, of Montreal, and Mr. Walter A. Dixon, of Toronto.

The location is 160 acres in extent. Assays of the ore by Prof. Chapman, of Toronto, give 60 per cent. lead and a high percentage of silver and gold.

We hear, writes the *London Iron and Steel Trades Journal* that a well known American engineer has prepared plans for six large blast furnaces, which are to be erected near to Ottawa, and we see no reason why pig iron production on a large and profitable scale should not soon be an important feature of Canadian industry. It is only a matter of time, and we believe that movements now on foot are likely to accelerate the event. The enormous production of pig iron in the United States has now rendered the great Republic practically independent of external supplies of crude iron, and we must be content to accept the inevitable and see Canada also become self-supporting in the matter of pig iron.

Sudbury District.

The Canadian Copper Company has closed down the Stobie mine for the present owing to the overcrowding of cars in the Sudbury yard incidental to the rush of business over the "Soo" branch of the C.P.R. Such a block has been created here that it has been impossible for cars hauling ore from the Stobie pits to get across to the Roast-yard at the Smelter. The closing of these pits will throw about 40 men out of employment.

The "Copper Cliff" continues to do well. A rich strike of ore was lately made in the fifth level at a depth of 520 feet from the surface. About 130 men are employed here.

A force of about 70 men is employed at the "Evans" under the superintendence of Capt. James, formerly identified with the Coe Hill mines. About 100 tons carrying 8 per cent. copper and from 2 to 3 per cent. nickel are raised here daily. A pile of 1,500 tons has just been roasted at this mine. All the ore, however, is not roasted here; several car loads per day being shipped to the Roast-yard at the Smelter.

The smelting operations, in which about 60 men are employed, continue to give great satisfaction. No. 1 furnace is at present idle, the trestle having been taken down to allow the construction of a dump beneath it and to admit improvements in running out the slag from No. 2.

The Dominion Mineral Company continues the development of their property. About 60 tons per day are being raised. The management are also roasting their ore. The Smelter has not been put up yet.

The Murray mine is also working, and is doing good work.

The *Globe*, in a recent issue, has the following comment on the proposed extension of the Central Ontario Railway from Coe Hill, its present terminus, to the Sudbury mines:

It is understood that the Railway and Mining Companies are prepared to undertake the construction of the road to Sudbury, the erection of a furnace somewhere on the line for making coke iron with a capacity of 250 tons per day, and the extension of their smelting plant at Sudbury to a capacity of 1,000 tons per day, on condition of receiving certain subsidies from the two Governments. These mining and smelting industries would give employ-

ment to a very large number of men from the outset, and would be a boom of immense value to a section of country that has been for some time in a very depressed state—the counties of Northumberland, Hastings and Prince Edward. The circumstances, too, seem to favor some town or city of Ontario as the location of works for the manufacture of nickel-steel, and for the refining of nickel and copper ores. The plant for the manufacture of nickel-steel alone would, it is stated, cost \$3,000,000, and the Canadian Copper Company has received offers of any financial aid they may require from British, French and German capitalists should they go into the enterprise. We learn on good authority also, that the Governments of Great Britain, France and Germany have each made an offer to purchase all the nickel which the company can produce in the next ten years, but probably these offers have been made without any conception of the possible output of the Sudbury mines.

Port Arthur District.

The year 1890 opens well for the Port Arthur District. The Badger Mining Company, owners of the Badger silver mine near Port Arthur, have just declared a first dividend, payable January 15th, of 50 cents per share on 50,000 shares, equivalent to 10 per cent. on the total capital stock of \$250,000. This is all the more remarkable when it is considered that the mine had previously returned to the proprietors all the original capital invested in the lands, buildings, mining works, machinery and mill, besides having ample cash for ordinary working expenses still left in the treasury.

The December shipment from the Badger consisted of 15 barrels of high grade ore and 13 barrels of concentrates; value \$17,000. Everything looks prosperous and business like around the mine. Several men are employed. The mill is running night and day.

Owing to the mild weather and heavy snow fall, the water in the Silver Creek still continues sufficient so that the anticipated closing down of the mill, owing to shortage of water, is still delayed.

The location of the railway through the mining region is being pushed, and no doubt there will be changes made which will shorten the line and assist in the more economic working thereafter. In the meantime, the present terminus of the road at the Kaministiquia River Crossing—called "Stanley" in commemoration of the Governor General's recent visit—is quite a busy centre.

The West End Silver Mining Co. held its meeting in Port Arthur lately, and has made arrangements for more vigorous work at this most promising mine.

The various veins on the Beaver mining property are being energetically and economically developed by the able manager, Capt. Hooper, who has also the management of the Elgin mine near by, which promises in the near future to be a rival of its older sisters, the Beaver and Badger.

The diamond drill is still enquiring into the depths below of the Beaver; when some 1,500 feet have been penetrated, the drill will doubtless be put to work to test the vein proper at various depths.

Work is going steadily on getting out lumber, etc., for mills, houses, etc., at the new town site of Kakabeka. The company is now being organized in Philadelphia, and on the return

shortly of the business manager the tunnel for the utilization of the water power for smelting and other purposes will be commenced.

The shipments of last winter from the Shuniah Weachu were 22 tons of a value of \$10,000. All the workings continue to do well. Excellent stopping ground has recently been opened.

The main shaft of the Wolverine is down 130 feet. The vein is improving with depth, but some difficulty is experienced with water in the shaft.

A rumor is current that the Porcupine has been sold to an English syndicate. The price mentioned is \$50,000.

Rat Portage District.

It is announced that English people will take control of the gold mine on Sultana Island, and that operations will be begun in the spring. It is said that the syndicate has an option to purchase the property after testing it.

British Columbia.

The Revelstoke Mining Co., with a capital of £40,000 was registered at Victoria on the 23rd inst.

The output of coal from the mines at Vancouver Island during the past year has been largely in excess of any previous year. The total production, estimating that of the East Wellington Colliery at 35,090 tons is 548,503 tons, of which the Wellington mines furnished nearly 50 per cent. Placing the value of the coal at \$4.50 per ton at the pits mouth, the total represents a value of \$2,468,263. These mines give employment to over 2,300 men.

The following are the returns furnished by the different companies:

WELLINGTON COLLIERIES.	
Foreign shipments.....	196,510 tons.
Home consumption.....	70,524 "
Total	267,034
Number of men employed, 900.	
UNION COLLIERIES (6 MOS.)	
Foreign shipments.....	27,551 tons.
Home consumption.....	100 "
Total	27,651 "
Number of men employed, 450.	
NEW VANCOUVER COAL CO.	
Foreign shipments.....	179,953 tons.
Home consumption.....	38,000 "
Total	218,818 "
Number of men employed, 845.	
EAST WELLINGTON COLLIERIES.	
Foreign shipments (estimated).....	35,000 tons.
Grand Total.....	548,503 "

The New Vancouver Coal Company has prospected extensively during the year, and has recently put a shaft down to the famed Wellington seam, and found coal of good quality. It is the intention to put this coal on the market this month.

A large force has been employed at the Union Collieries opening up the mines at Union Bay, near Comox. It is expected that early in the year the property will be opened up sufficiently to permit the production of a large output, the company being under contract to the Southern Pacific Railway Co. to furnish 7,000 tons per day.

Considerable interest has been taken and a good deal of money spent last year in the claims in the neighbourhood of Kootenay Lake, but the want of a railway and the difficulties of transportation are still felt to be serious obstacles to the rapid development of what otherwise is a most promising field.

With increased facilities for production at the Wellington and Vancouver pits, and the assured improvements at the Union, there is every reason to anticipate a very much greater increase in the output of coal during the year just begun.

The Wellington and Vancouver Coal Companies have greatly extended their operations; the former has lately put down a shaft and found abundant coal of excellent quality.

Messrs. Wells, Fargo & Co. report an increase of \$15,751.47 in the shipments of gold dust from the province during the year. The following are the figures for 1889:—

Bank of British Columbia.....	\$253,123	87
Bank of British North America.....	46,489	64
Garesche, Green & Co.....	188,580	11
Total, 1889.....	\$488,193	62

At the Nicola Mining and Milling Co's "Joshua" claim, in the Nicola district, about 28 miles south of Kamloops, a shaft is sunk 400 feet, while a tunnel has been drifted in one direction 600 feet, and another in a different direction, 1,100 feet. In addition, levels have been run from the shaft at every 100 feet, these extending from 150 to 250 feet. The "Tubal Cain," owned by the same company, is down 220 feet, and the "King William," another of these claims, is down 200 feet. There is now lying at Kamloops Station a 30 H. P. engine, with boiler, and 1,000 feet of wire rope recently purchased for hoisting purposes at the "Joshua" and other claims. This machinery will be taken out and set in position at once so that operations may begin early in the spring.

The "Mary Reynold's" claim, owned by J. Hepburn & Co., has now three shafts—one 100 feet, one 75 feet, and one 35 feet, all on the same vein. Drifts are also run from the 100 feet shaft, a distance of 90 feet; 3,500 tons of ore have been shipped to San Francisco, averaging \$163 to the ton. There is estimated to be \$10,000 worth of ore on the dump, averaging from \$50 to \$60 to the ton.

On the majority of the claims located in the Nicola district only assessment work was done during the past year. Several causes have led to this result, but probably the most potent was the closing down of the Star Mining Company early in the spring, followed by the burning of the quartz mill and other plant connected therewith. The prospects for a renewal of active operations during the present year are, however, good, the success of the Nicola Milling Co. having inspired confidence in the future of this promising field.

In the Illecillewaet district the development of a number of excellent claims proceeds steadily, and much activity is predicted during the coming season. Want of a home market where the value of ores could at once be realized, the difficulty and expense incurred by shipments of ore over long distances, and the lack of the necessary capital required to open up new claims, have been the great drawbacks

against which the poor prospector has had to struggle in recent years. But the outlook is more encouraging. A smelter has lately been erected at Revelstoke by a wealthy syndicate, and although the sampling works only have as yet been in operation, the management are prepared to receive and pay cash for the value of all marketable ores. The erection of these works cannot fail to be productive of the most beneficial results, and will undoubtedly prove to be a most important factor in the mineral development of the district.

But little work was done by the Cottonwood Gold Mining Co. Early in the year an excellent trail was graded from Nelson to the mines—four miles. The machinery imported was, however, found to be very defective, the so-called expert proved incompetent, and operations were early suspended. It is reported that the management intend to introduce a better plant this year.

A large number of improvements have been made at the "Poorman Gold Mine" which passed into the hands of the present company in the spring, at a price, it is said, of \$35,000. A Pelton wheel, to run under a head of 250 feet has been set up, Eagle Creek supplying the water. A large number of buildings have been erected, an expenditure of \$30,000 being represented in the labor and plant provided. Mr. Nail, the manager, is wintering with a gang of men at the mine, and expects, with the running of his mine in the spring, to turn out more than enough gold to cover all the expenditure.

Much of the progress of the Kootenay Lake district is entirely due to the energy and enterprise of Dr. W. A. Hendryx, an American physician, who first became acquainted with the country and its rich mineral resources during a shooting excursion in the fall of 1884. Impressed with the district as a basis for investment, he formed the Kootenay Mining and Smelting Co., and started work on the "Blue Bell," a claim notorious in its connection with its former owner Sproule, who, it will be remembered, was hanged in Victoria for the murder of a miner working on an adjoining claim. Obtaining a charter from the Territory of Idaho, Dr. Hendryx put through a waggon road from Kootenay Station to Bonner's Ferry. Until the end of last season this was maintained as a toll road, but it has now been sold to the county. It is free of tolls and is to be rebuilt. The doctor put a small steambot, the *Surprise*, upon the river, and a year or two later added the *Galena*, which latter boat was enlarged and equipped with new machinery last winter. These boats and the *Idaho*, built by a Mr. Foy, have carried in the miners and the freight, and all the ore from the mines.

Some months ago the Government Reduction Works in Cariboo were set in operation, but it is generally known that the results were not very satisfactory, inasmuch as by the processes adopted only some 60% of the gold contained in the rock operated upon was secured. In order to attain better results a chlorination plant was added, and was put to the test lately with results that have proved eminently successful. On 23rd instant the Minister of Mines received the following telegram from Mr. E. A. Martin, the Superintendent at Barkerville, "Chlorination perfect success. Five trials. About eight tons yielding over 90%."

Development work upon the "Blue Bell" has never ceased since it was acquired by this company. Tunnels have been run into the bluff from all sides, and everywhere the material in good paying quantity has been struck. A working tunnel has lately been run in from the water front, and an engine and drill, with a small force, are now at work there.

The Toad Mountain Silver Mines, operated by the Hall Co., are reported to have yielded gratifying results on the year's operations. This valuable property has, however, been involved in litigation, and it is to be feared that further trouble is ahead, as it has lately leaked out that a couple of gentlemen from Victoria have visited the ground and staked out and recorded claims on the property now operated by the Hall's, as the "Kootenay Bonanza" and "Silver King" mines.

Silver Exports from Port Arthur Mines, 1889.

The following are the official returns furnished the REVIEW for the year ended 31st December last:

1889.	Silver Ore.		Bullion.		Total.
	Tons.	\$	Oz. troy	\$	
January....	1	1,050	.....	.....	\$ 1,050
February..	18	25,200	3,900	3,900	29,100
March.....	.....	.....	.....	.....	.....
April.....	.....	.....	1,293	1,293	1,293
May.....	.....	.....	.....	.....	.....
June.....	12	15,000	.....	.....	15,000
July.....	.....	.....	.....	.....	.....
August....	9	2,500	.....	.....	2,500
September..	32	48,630	.....	.....	48,630
October....	39	60,000	.....	.....	60,000
November..	40	41,480	1,920	1,200	42,680
December..	15	10,000	1,941	1,800	11,800
	166	\$203,860	9,054	\$8,193	\$212,053

Company Floating in London.

BY A CANADIAN

Standing in Rotten Row, watching the never-ending procession of costly equippages, a man remarked in a tone of soliloquy, "There's great wealth in London."

A man in the "city" said, "I know a hundred and fifty Americans who are here trying to float companies."

These remarks illustrated the saying "Where-soever the carcass is there will the eagles be gathered together." Possibly some ardent student of prophecy will also see in the mention of the feathered emblem of America a prediction of the second statement.

Wealth and wealth seekers are natural associates, and the fame of the riches of London draws to it from all the world those who can offer inducements for the investment of money. All sorts and conditions of men are represented in this group,—the railway king, the finance minister, the miner, rancher, inventor, schemer, and those who agree with the Tichborne claimant when he remarked, in language not suggestive of an aristocratic education, "There's men that has money and no brains, and men that has brains and no money. Them that has money and no brains was made for them that has brains and no money."

The favorite mode of securing investment is through the formation of limited liability companies. Prior to the year 1856 persons who invested in a joint stock enterprise were ordinarily liable individually for the whole debts of the concern, and many people were ruined by investing merely small amounts in undertakings that became bankrupt. In that year the principle was introduced in England of limiting the liability of an investor to the amount subscribed by him, so that whatever the fortunes of the company he could not be called upon to pay anything beyond the sum he had promised. In 1862, and in subsequent years, this principle was embodied in the "Companies Acts," and the details for the formation and management of such companies were fully prescribed and regulated. In consequence of this legislation an immense impetus was given to investment in that direction, and the number of companies attempting to float every year in England is something enormous. In consequence, the promotion of companies has become an established business, the methods of which are peculiar and interesting. Many companies are formed privately; the capital is subscribed through personal solicitation and the only necessary legal measure is for seven persons to sign the memorandum and articles of association setting forth the nature and regulations of the business. These have to be registered at Somerset House in London, after which, if approved, letters of incorporation are issued.

But the great multitude of schemes do not get their capital so easily and cheaply. There are many variations in the methods, but some of the most common means of floating companies are as follows:

An American has a gold mine in Colorado that he wishes to sell for £50,000. He seeks a "Company Promoter" in London. No one has a sign hung out bearing that name, but the article is often to be found under the sign of "financial agent," "broker," "accountant," "solicitor," "attorney," or without any designation. The promoter takes the papers and studies them. If attractive he makes an exhaustive examination, and there are few sharper or keener men in the world. He looks to see if it is genuine, and if it would "take with the public," the latter being with some the chief consideration. If he decides that the scheme has merit and will "go," he visits several capitalists, who form a syndicate and agree to float the company and pay for the mine the amount asked, but paying as much of it as possible in shares. They increase the price of the mine from 25 to 100 per cent., the increase being to cover expenses and pay them a profit for "underwriting" the company. The needed working capital is added to the price of the mine, £75,000 for the mine, and £25,000 for working funds, making the total capital £100,000, which is divided into shares of £1 and upwards; £1, £2 or £5 being the most popular; and £10 being the most genteel.

Now a telling board of directors must be got. The promoter has a list of men and their prices, needy men of title and position, who for an "honorarium" a yearly remuneration of £50 to £100 and a fee of a guinea for each meeting attended, are willing to lend their illustrious names and give the investors the benefit of their oversight of business experience. Such men are termed "guinea pigs," and many noble persons are enrolled in the list. A full-fledged duke may be had for an "honorarium" of £1,000. A right hon. captain may accept £500, and a member of parliament may be had for £250. A weighty list of names, five or seven in

number having been secured, with eminent firms as bankers, brokers, auditors and solicitors, each of whom perhaps receives a substantial honorarium, a glowing prospectus is written and printed, and after a dozen revisions to see that it is within the bounds of the law and that every clause is calculated to impress the public, it is approved for circulation.

The syndicate do not propose to risk any cash, and the next step is to go to an advertising agent, who estimates the cost of printing and circulating 100,000 prospectuses and of advertising in all the leading papers of the United Kingdom. This being determined, he seeks a "syndicate" who will advance the money for expenses and take the risk of the company's "going into allotment." If the capital is not subscribed by the public this amount will be less, but if the company "floats" it will be repaid three or fourfold according to judgment of the risk taken. Occasionally the expenses of a company of great promise are advanced and insured for "two to one," but mines are seldom taken at less than "three to one," that is, for each thousand pounds advanced three thousand are paid.

All being arranged, the prospectus and forms of application for shares are printed. They are sent to an agent who employs perhaps 250 men working night and day addressing them. The lists of addresses are made up from the share lists of companies and are classified so that separate lists are kept of investors in mines, railways, manufactures and special branches of trade. Some agents claim their lists to have such value, owing to judicious selection, that they charge five per cent. upon the capital merely for addressing the prospectuses. The clergy are almost always included in the list as they have often a surplus from the salary to invest and are supposed to be less able to criticise than laymen.

The post office is notified to send its vans and the whole batch of prospectuses is posted on one evening, and the next morning every great daily paper has the prospectus in its advertising columns, and a notice of the company in its money article. Thus the prospectus and the paper bring their joint message to the investor, and if he favors the scheme he signs the application and sends it with a deposit to the bankers of the company.

Now the trouble begins for the promoter. The papers that have not been favoured with the advertisement and the numerous weekly "financial" papers flock to the office with promises of favourable leading articles and ominous intimations of what will happen if the advertising is held from them. The editor of the *Christian Union* sends his compliments and proposes to make "special and favourable mention" of the company, enclosing the proof of a leading article elevated to fulsome adulation of the enterprise. The neglected papers at once prepare denunciations and exposures of "the great swindle;" they bring proofs to the promoter in hopes of being bought off, and, if he is abudate, the abuse appears in the next issue, and the admiring public glory in the fearless courage of this standard of honesty that dares to expose wickedness.

Members of the stock Exchange go to the brokers' office and ask them, "Are you going to support the market?" If the answer is "No," they leave the matter to the mercy of the investing public, but if the answer is "Yes," they send in applications for shares and begin buying and selling them among themselves, running the price up to a premium. This attracts outsiders who buy for "a quick turn,"

and as soon as the shares are unloaded on these people the apparent demand ceases. The majority of the companies are subscribed for in this way by brokers and speculators who desire to gamble with the shares and make quick profits. The number who invest genuinely for the sake of future dividends is small. The business is so overdone that the daily receipt of prospectuses goes into the waste paper basket. One scheme that sent out a million prospectuses got no applications. But anything that seems likely to "go to a premium" is rushed after. Each applicant asks for five or ten times more than he wants, in order to be sure of an allotment of the number of shares desired. Thus the capital is subscribed for over and over again when perhaps there is hardly one genuine investor who means to let his money remain in the shares in hope of dividends. The shares are taken merely as gambling counters in the hope of selling them at a profit before they need to be paid for. A year or two ago in London a timber business that had some great names on its prospectus was subscribed for twenty times over; a dog biscuit company had also twenty times the desired applications; a company for boiling down dead horses was subscribed for ten times over; a cigarette company got five times its capital subscribed. The success of the timber concern made promoters think that the public were waking up from their lethargy. In the next week 34 new companies were registered, only some of which went to allotment and of these only two were fully subscribed for. People think all this capital sought investment, but the figures no more represent cash than do the aggregate transactions of the Chicago Produce Exchange. Shares are applied for as grain is bid for, merely to sell over again without passing money.

But we have left our ideal mining company on the first day of issue. If applications come in freely, announcements of the fact are put in the papers, and it is advertised that the lists will close in one, two or three days. This is expected to hurry up investors. If the shares have been sufficiently taken up to give enough capital to pull through with, the company sends out its letters of allotment and has "floated."

There are said to be more company wreckers than promoters in London, and these now have their innings. The wrecker goes to the office and demands the list of shareholders, offering the legal fee for the same. This is given through fear of a summons from the Lord Mayor if refusal is made. The "financial paper" containing the most abusive article is mailed to each shareholder with a letter from a lawyer stating that the affair is a swindle, and if entrusted with the case he will endeavor to recover the deposit money. Armed with appealing letters the wrecker, who may be the lawyer, enters the company's office, expresses regret that such bad reports have got out and that his clients are so alarmed. He expresses confidence in the enterprise and intimates that if £500 should be given to him to distribute among the frightened shareholders, he can "square them." If the concern is really bad, the £500 is paid; the wrecker pockets it, and writes to his clients that the company is sound, and they have been misinformed.

When a company is proposed, it is generally assumed that it is a scheme for plunder, and every one rushes for a portion. Thus the large figures on the prospectus are divided among a numerous crowd, and the envied vendor, who appears to be reaping a rich harvest, sometimes barely escapes with the coat on his back.

It makes a much better impression on the public if payment for the property to be sold is taken in shares instead of in cash, but as the shares are usually sold, it is the same thing to the vender, and he gets credit for confidence in the enterprise at no expense. In fact, many promoters prefer their claims to be paid in shares, as they expected to sell them at a premium.

A promoter whose scheme failed to float and was thoroughly exposed in the financial papers, soon after started another company. A friend said to him, "Do you think anything with your name on it would go, after this last failure." "Oh, that doesn't matter," said the promoter, "there's a new fool born every minute."

Although Carlyle said the people of England were "mostly fools," it is not the fools who mainly support these things. They have been again and again exposed in papers and magazines, and a wide distrust prevails. The popular sentiment is shown by one of the "gags" of the theatre; an actress wishes to describe a mendacious person and exclaims, "He is like the prospectus of a limited company." As has been remarked, the investments of this class are mainly supported by the speculators who only consider whether the shares will advance in the market, and pay a little heed to the lasting merits of the enterprise.

There has been lately a great movement towards turning industrial enterprises, manufacturing businesses and trading concerns into limited companies. This is a good way of preserving a profitable business when its proprietor becomes incapacitated, and is in accord with the spirit of the age which favors co-operation and a wider distribution of profits. But, doubtless, many rotten concerns have by this means been unloaded upon the public.

One gets the impression while moving in financial circles in London that gambling has become a recognized business, and that any means taken to promote such a cause are legitimate. Pious, devout men are engaged in these schemes, and men who will not hesitate to "support the market" and bid up their own shares will refuse to advertise in a Sunday newspaper.

All this business clusters about the vicinity of the Royal Exchange, which bears the inscription on its portico, "The earth is the Lord's, and the fullness thereof."

Increasing Demand for Plumbago.—

Few articles which enter largely into mechanical processes have, of late years, received more extension of their use than has plumbago. Until comparatively recently its employment was mainly confined to the manufacture of crucibles, while outside of these the imports of it by the United Kingdom were principally devoted to the manufacture of inferior lead pencils, and of what was nominally termed blacklead compounds for domestic stove cleaning etc. But of late years other qualities have been discovered to be possessed by this mineral, which has largely widened the sphere of its employment. It is as a lubricant that its high qualifications are now generally admitted, and its use in that character has greatly tended to increase its use; so greatly so, indeed, that whereas some years back its price ruled so low as £7 10s. the ton, contracts for its supply are now made at £20 the ton on board ship at the ports of export.

Gold Milling in the Black Hills.

(H. O. Hoffman, Rapid City, Dakota.)

(Continued from December issue.)

Those that are still good (dies last six weeks) are returned to the mortar without further cleaning. After the dies have been taken out the remaining sand is shovelled out and piled up in a convenient place in the mill to be treated separately in the rocker and the pan (see later.) It is rich in amalgam and contains pieces of iron that have accumulated in the mortar. Any particles of amalgam that have adhered to the rough sides of the mortar are removed and added to the sands. The dies are now put in place again. If new shoes are required they are placed on top of the dies, with the wooden collar slipped over the shank. Then the recesses for the chuck-block, screen-frame, etc., are cleaned by directing a hose upon them, and these are put in place, the screens having first been cleaned in a wooden box with brush and water. When the chuck-block is in place, the sands first removed are shovelled in to fill the bottom of the mortar up to the top of the dies. The drop of the stamp has now to be regulated. If new shoes are used, the wooden block, 1 inch higher than the drop, is placed on the shoulder of the shoe and the stamp let down until the head rests on the block. If the shoe has not been replaced, the block stands upon the die. In both cases the keys of the tappets are loosened, these are allowed to fall on to the prop and are then keyed up again. The apron-plates are now dressed in the usual way. Any amalgam adhering to the small sluices, leading to the mercury-traps, and to the sluice-boxes is removed and these are brightened in the same manner as the apron-plate. When the engine has been started up, the stamps that have new shoes are first allowed to drop several times until the sound and the vibration, felt when touching the tappet, show that the shoe is thoroughly fastened to the head. The splash-boards are put back in place, some ore is fed into the mortar, the water is turned on and the stamps of one battery after another are let down from the props. Special care has to be taken by the feeders to regulate the ore supply, as the mortars are empty above the dies when the mill starts up.

In cleaning up a mill, all the hands have to take part, the night shift working six hours extra.

This detailed description of the clean up of a 120-stamp mill has been given, because it seemed important to show how it is possible to accomplish it in the short space of seven hours without requiring any outside help. When it is remembered that more than a day was formerly consumed in this work, it will be seen how admirably the operations are now systematized and worked one into another.

When the clean-up of the mill is over and the stamps are once more in operation, the sands that were shovelled out from the bottom of the mortar have to be worked up and the amalgam has to be cleaned, so as to be ready for the retort. Two crush-men are detailed to clean up the sands. These contain bits of iron that have come from the tools used in the mine or the crushing machinery of the mill, and also pieces of amalgam. The sands are first treated in a rocker. Any coarse pieces of iron are picked up and collected in a separate heap. When the sands have been rocked for a little while and the hose has been played on them, the residue on the hopper is broken as fine as possible with a wooden mallet. The products obtained by rocking are the coarse particles remaining

finally in the hopper. These are washed in a coarse screen over the clean-up pan, and any amalgam remaining on the screen is picked out and thrown into the pan. The sands go back to the battery. The heavy sands that collect on the curtain and riffle are taken up in a bucket to be worked in the pan. Those settling in the sluice which conducts the slimes to the waste flume are shovelled out and returned to the battery.

There remains the purifying of the amalgam collected from the chuck-blocks, apron-plates, sluices leading from the mercury traps, mortars, old shoes, dies and screens. It is charged with water into the clean-up pan (5 ft. in diameter, the muller making 30 revolutions per minute) and from 600 to 700 lbs. of quicksilver are added. It takes about three hours to clean in the pan all the by-products that contain any amalgam. When this is all collected and the water above it is somewhat clear, the muller is raised with block and tackle and the entire contents of the pan are emptied through the lowest discharge-opening into a square box which overflows into the tailings-discharge box. The muller and bottom of pan are cleaned with brush and water. The liquid amalgam in the first box is now freed from water and passed through a strainer. The resulting pasty amalgam is removed, and freed from the excess of quicksilver by wringing it in canvas bags in water. The balls of hard amalgam remaining in the bags contain about 38 per cent. of gold. The quicksilver collected beneath the strainer goes back to the main stock; that obtained by squeezing the pasty amalgam is first verified by adding some nitric acid, stirring it, and then washing it with water.

The clean-up on the fifteenth of the month is much simpler than that on the first, as only the chuck-blocks are taken out and the mortar is left intact, except, of course, when any break has occurred in shoe or die. On the fifteenth, however, the mercury-traps are cleaned. Their contents go simply into the pan and are worked with the rest of the products containing amalgam. This clean-up lasts five hours—that is, two hours less than the one on the first of the month.

The cleaning up of old iron and wood chips, which is done once a year, stills remains to be mentioned in this connection. The pieces of iron that are picked out from the sands in the bottom of the mortar are first scraped, to remove any amalgam adhering to them. They are then thrown out upon an enclosed heap in the yard and left there to be corroded by atmospheric action. The rusting is hastened by adding some salt to the heap at various times. Once a year, the iron that has entirely fallen to pieces is charged with quicksilver into the pan and its gold extracted. The chips of wood, which float on the top of the water in the battery and often clog the screens, are repeatedly removed and collected in a box in one of the window recesses. They are then emptied on a heap in the yard, and once a year are set on fire. The ashes are collected and amalgamated in the pan. In this way are saved every year from 16 to 18 pounds of amalgam from the two mills of the Homestake Company (200 stamps).

Retorting and Melting.—The quicksilver still retained by the hard amalgam is removed by retorting. Both bulb retorts and cylindrical ones are used. They are all of cast iron. The cylindrical retort of the Homestake Company is 12 in. in diameter and 3 ft. long, and holds about 1,000 lbs. of amalgam. The usual charge of 500 lbs. is retorted in about 6 hours with $\frac{1}{4}$ cord of wood. The loss of quicksilver is nominal.

The retort-metal amounts to 38 to 40 per cent. of the original charge. At the Caledonia mill it is only 33 per cent., less care being taken in cleaning the amalgam; and at the Deadwood-Terra mills it is often only 25 per cent., by reason of the fine condition of the gold, which requires more quicksilver to form amalgam.

The retort-metal is now melted into bars. At the Homestake mill, two kinds of moulds are used, the 1500-ounce silver mould, 5 by 5 by 11½ inches, and the 700-ounce mould, 3½ by 4 by 9½ inches. The bars are cast from 3 to 4 inches thick and weigh from 1000 to 1400 ounces. It takes about four hours to melt four 1400-ounce bars and the crucible lasts for from eight to twelve charges.

The loss in melting with Homestake retorted bullion is only 1.5 per cent. and the average composition of the bars is 820 gold, 165 silver, 15 base metal. The loss of the Caledonia bullion is greater (7 per cent.), as less care is taken in cleaning the amalgam. The average composition of its bullion is 798 gold, 182 silver and 20 base metal.

The bullion is sampled, weighed, assayed and shipped,

VII. WORKING-RESULTS

The Homestake and Golden Star mills together produced, according to the report of the Homestake Company, from June, 1887, to June, 1888, \$895,822.37 worth of gold from 243,355 tons of ore, which corresponds to a yield in free gold of \$3.68 per ton. It is claimed that 85 per cent. of the free gold is saved. According to this the ore would run in free gold \$4.33 per ton. The total value of the ore varies from \$5 to \$10 per ton; the amount of concentrates in the pan, is \$24 per ton, although judging from the average assay of the tailings, (\$1.50 per ton) a much higher figure would be expected.

Two sets of experiments were made in the spring of 1885 by Dr. R. Goering on the Homestake and Golden Star tailings, the first when the mills had no mercury-traps, the second after these were introduced. Up to that time there had been collected by means of blankets in a separate building (the blanket house) 1124 tons of concentrates which assayed \$35.16 per ton. These, panned down, gave 20.5 per cent cleaner concentrates, assaying \$40.18 per ton. When amalgamated in the pan they yield 55.9 per cent. of their total value, the remaining pure pyrites assaying \$17.08 per ton. This shows that the gold recovered must have been either enclosed in quartz or rusty, or that amalgam had been carried off with the tailings and was recovered by the blankets. When in consequence of these tests the mercury traps were introduced, the loss was reduced. The concentrates then saved assayed \$27.63 per ton. They gave up 92 per cent. of their gold in the pan, but the pure pyrites still assayed \$12.26 per ton, showing that while the loss had been diminished, it had not been stopped. The concentration of tailings by blankets, being too expensive, was given up.

From the other mills under the Homestake management no official reports are made public; therefore no data can be given. It may, however, be stated that the tailings from Highland ore average \$1 per ton, those from Deadwood-Terra ore \$0.50 per ton, and seldom exceed \$0.75. It would be interesting to find how small the amount of concentrates is and how high these would run.

One point still remains to be considered in regard to working-results, that is the fineness to which it is necessary to crush the ore. Dr. R. Goering made tests to find a relation between size and assay value of tailings. Samples were

taken hourly for a length of time and the sands obtained dried, weighed and screened through different sieves. The figures are given below:

TABLE VI.—Reduction between Size and Assay-Value.

Per cent in weight.	Passing through screens, No.	Remaining on screens, No.	Assay value per ton.
94.07	50	..	\$1.24
2.53	50	40	2.13
3.40	50	..	2.79

They show that the loss in the tailing increases rapidly, if the screens are allowed to remain too long in the mortar. This is still better shown by another series of experiments (December, 1888) on tailings, running \$2 per ton, that were screened through a No. 30 mesh sieve. Of these, 6 per cent., that did not pass through the screen, assayed as high as \$5.02 per ton. The result is, as has been said before, that the heavy Russian-iron slot screens have to be exchanged every fortnight.

The Caledonia mill crushed, from May, 1887, to May, 1888, 73,425 tons of rock and produced \$295,816.25 worth of bullion, equalling a yield of \$4.02 per ton in free gold. Figures corresponding to those given in the Homestake Company could not be obtained. It may, however, be stated that the blanket concentrates of the Caledonia, amalgamated raw in the pan, yield a product of pure pyrites, assaying \$90 to the ton, and that the tailings from the blankets, when panned, yield concentrates worth from \$7 to \$9 to the ton.

TABLE VII.—Cost of Milling in 1887-88 at Homestake and Golden Star Mills.

Items.	Homestake Mill. (96,790 tons treated.)		Golden Star Mill. (146,565 tons treated)	
	Amount expended.	Cost per ton.	Amount expended.	Cost per ton.
Labor	\$24,789 90	\$0.2561	\$31,338 60	\$0.2138
Supplies	1,263 71	0.0130	1,149 65	0.0079
Water	16,731 37	0.1729	25,097 10	0.1712
Wood	26,773 50	0.2766	40,156 50	0.2739
Machinery ..	8,924 06	0.0922	17,884 96	0.1220
Oil	1,052 69	0.0109	1,233 21	0.0084
Candles	156 00	0.0016	214 50	0.0014
Quicksilver ..	1,001 25	0.0103	3,701 05	0.0252
Lumber	684 06	0.0070	799 16	0.0054
Total	\$81,376 54	\$0.8406	\$121,574.73	\$0.8292

In comparing the cost of milling in the 80 and the 120-stamp mills, it seems strange that there should be so little difference. Special causes must have affected this year's work, for the cost per ton in 1880* was \$1.3018 and \$0.7770 respectively.

The cost of milling at the Caledonia mill for 1887-88 was \$0.87 per ton, ½ going to labor and ¼ to material. This is a low figure, if we consider that the mill has only 60 stamps and that the ore treated is very hard in comparison with any Homestake rock.

VIII. CONCLUSIONS.

Two striking features are presented by the foregoing review; the simplicity and effectiveness of the methods by which the free gold is extracted; and the evident waste of sulphurets in the tailings. These sulphurets appear, according to the figures given above (3 per cent., assay-

ing \$24 per ton), to be quite rich enough to repay working.

A simple and cheap method of concentration, for the large quantities to be treated, would probably be as follows: The pulp, after passing over a series of spitzluten, which would sort out the coarse sands, would overflow into a series of spitzkasten, and the overflow of these would be waste. The coarse sands, sorted out by the spitzluten, would contain, according to experiments made in 1885 on the large heap of concentrates, free gold, which would be recovered by crushing them wet in rolls or a Chilean mill, allowing the pulp to flow over amalgamated plates, and then pass over a separate series of classifiers or else go back to the main system. The graded pulp, obtained by the different spitzkasten, would be separated on continuous round tables, into pure concentrates, middlings, and waste.

The middlings would be worked separately, or be pumped back to the main system of spitzkasten. The cost of concentrating the tailings would probably not exceed \$1 per ton of sulphurets.

The method of working these concentrates would be that of barrel-chlorination, using bleaching powder and sulphuric acid to generate the chlorine. In a paper read before the Institute at the Buffalo meeting, October, 1888, Prof. William B. Phillips says the cost of dead-roasting on a 12-ft. revolving hearth, at the Phoenix mines, North Carolina, is \$2.03 and \$2.18 per ton. A combination of two systems of furnaces would probably accomplish this dead-roasting at a proportionately cheaper rate at the mills, where wood is \$6 a cord and labor \$3 and \$3.50 a day. The Spense automatic desulphurizing roaster would do the preliminary roasting cheaply, and the revolving hearth would effectually dead-roast large quantities of ore, whose sulphur had been nearly all eliminated. Prof. Phillips further gives the cost of chlorinating at \$2.66 per ton of concentrates. This figure would have to be considerably increased for the Homestake and other mills. The total cost would probably be not over \$8 for the ton of concentrates.

In closing this paper, the writer desires to express his thanks to the management of the Homestake and Caledonia mills for their courtesy in allowing him the run of the works and to Dr. R. Goering for his valuable assistance in obtaining detailed information. Also to Messrs. R. Graham and Chas. Ruth, for their uniform kindness in answering questions.

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*Tenth Census of the United States, vol. xiii., p. 280.

Florida Phosphates.

Mr. W. P. Frost, Savannah, Ga., sends us the following, which we have pleasure in reproducing:

As Florida phosphates seem to be exciting a great deal of interest all over the country among fertilizer manufacturers and dealers, more especially in Charleston, where it is, of course, a matter of vital importance, and as there seems to be a dearth of accurate and intelligent information on the subject, a few remarks by one who professes to be an expert on such subjects, and who spent a month in Florida this summer looking up this matter, may be interesting to your readers.

No geological survey has ever been made of Florida, it being regarded as a "sand bank and a coral reef," and for this reason the value of her phosphate and other mineral deposits have been overlooked. Now that the present boom has been inaugurated, however, we may look for the development of some very valuable finds, not only in phosphates, but in other minerals, such as natural cement, gypsum, etc.

Fossil bones and phosphates, mostly low grade, are found nearly over the entire State, but in too small quantities to work. As is naturally to be expected, the former being more recent than in South Carolina, remains are in a better state of preservation, and some few handsome specimens are to be found. In the Sub-Tropical Exposition at Jacksonville is to be seen a magnificent specimen of the skull of a mastodon, wonderfully well preserved and with tusks five or six feet long. Numerous valuable fossils have been sent to Washington. The fossil remains found consist principally of the ribs of the manatee or sea cow, which are also found, though not so abundantly, in South Carolina. It is a curious coincidence that all the phosphate deposits so far discovered are on the Gulf coast. Nothing has been found on the Atlantic side of the peninsula. On the South Atlantic shore, however, which is very undeveloped, a better acquaintance may result in something.

Beginning on the Gulf coast, then, in the extreme northwestern corner of the little spur that runs out from the peninsula proper, we find the Sopchoppy Phosphate Company organized, and working in a desultory way a deposit in Wakulla County. Following the trend of the coast southwards, we come to the Sawannee River, at the shoulder of the peninsula proper, which has furnished most of the fossil remains found, and which is said to literally bristle with them.

Coming southwards, we next strike the Withlacoochee River, on whose banks, about eighteen miles from the Gulf, the great phosphate deposit of Florida, and perhaps of the world, has been discovered. The next deposit of phosphate we hear of is in the Alafia River, a small tributary of Hillsborough Bay, near Tampa. On the southern shore of the mouth of Tampa Bay, on Tenaceia Island, and on the adjacent mainland, we find phosphates, which are also reported a short distance away in the Manatee River. Running our finger further south along the map we enter Charlotte's harbor, at the head of which enters Peace River, and at another point the Myakka River, on both of which there are phosphate deposits, but more especially on the first.

Up to September last these included all the known deposits of phosphates in Florida, although there were indistinct rumors of a valuable find on the South Atlantic coast, which, however, does not seem to have materialized.

Any one who has followed this description, with a map before him, will see that the whole Gulf coast is a phosphate bed. Fortunately, however, for our Carolina phosphate magnates, the majority of these deposits are of little or no value. The Sopchoppy deposit consists principally of a low grade phosphatic sandstone, mixed with a considerable percentage of fossil bones, which bring up the average analysis to something like 40 per cent. of phosphate of lime. It is not regarded as very valuable, although it might pay to separate the bones, which analyse about 70 to 75 per cent.

The Suwannee River deposits are not extensive enough to be worked profitably and are interesting from a scientific and geological standpoint only.

The next deposits are situated on the Withlacoochee river, about eighteen miles from the Gulf, near Dunnellon, a small place on the Silver Springs, Ocala and Gulf Railroad, a branch of the Florida Central and Peninsular, or the old Florida Railway and Navigation Company, which runs from Fernandina as far south as Orlando, with numerous branches. The deposit is owned by the Dunnellon Phosphate Company (lately organized), of which Mr. Geo. F. Dunn, of Ocala, is the president and principal stockholder. They own, altogether, about thirteen thousand acres of land, which was all selected by a prospecting party, who had a chemist along with them, and who purchased only where they saw phosphate indications. The company is capitalized at a million and a quarter dollars, two hundred and fifty thousand dollars of stock being for sale.

In order to understand the formation of the deposit, it is necessary to state that considerable tracts in Florida are underlaid by solid beds of carbonate of lime, which is still in a soft state, a little harder and more crystalline than our marl. This begins at varying depths from the surface, (sometimes only one or two feet), and continues down to great depths. The surface indications of this deposit are large slabs of flint, which occur in veins in the carbonate, and are left on the surface after the latter has been dissolved away and soil formed in its place by the gradual process of nature. The formation of the Dunnellon phosphate beds corresponds exactly with this carbonate formation, which leads to the theory that they were probably formed by the leaching away of the carbonate and the gradual deposition of phosphate of lime in its place. The surface indications in this case are (usually) a hard, dense, stratified, white rock, which analyses as high as the equivalent of 75 to 80 per cent. of bone phosphate of lime, and will average about 70 per cent. This is disseminated through the surface soil in varying quantities, where it is found, but by no means constitutes the bulk or the most valuable part of the deposit. Beneath this, at depths varying from one to five or six feet, is found a material varying in color from pure white to a dark, creamy yellow, and having nearly the same consistency as our South Carolina marl. I myself have seen an auger bored down sixteen feet into this stuff without getting through it. To this depth it remained of the same mechanical consistency throughout, perfectly smooth and free from grit. In other words it was a solid bank of phosphate (16) feet thick, to my certain knowledge. How much thicker I do not know, but "Crackers," (*i. e.* natives,) who were ignorant men and did not know the value of the material, (as evidenced by the fact that their lands were being bought from them every day for a song,) testified that they had seen wells dug in

this material, before getting through it to a water-bearing strata, to a depth of sixty feet. I do not mean to say that this deposit covers the whole tract which the company owns. It occurs in pockets, and runs in ridges parallel to the old shore lines and to the Apalachian range—*i. e.*, northeasterly and southwesterly. From my limited knowledge of the deposit, however, and the fact that all the land was, as I say, carefully and intelligently selected, I should regard, as a safe and conservative estimate, that it occurs on one-fourth of the thirteen thousand acres. However, as I was only on the ground for one week, my opinion on this point may not be reliable. I have not seen an analysis of it which ran below 50 per cent. of phosphate of lime. Several made by myself and other chemists ran 60 to 65 per cent. The average would be probably 55 to 60. It contains a trace of carbonate—no fluorine—a very small percentage of sand, about half per cent. of potash, 40 per cent. of lime, and 10 to 15 per cent. of iron and alumina. This latter is very injurious, ordinarily causing the soluble phosphoric acid in the acid-treated material to revert, (which in England is a very serious matter,) and also preventing it from drying out, another very serious objection here and elsewhere. But from experience gained in treating several samples of this material with acid I have come to the following conclusions: First, that the acid-treated material will dry out, especially when made from the marly or clayey deposit, which combines with the acid with great avidity, soaking it up and getting very hot without getting liquid at all. This is with the sun-dried material, and using such proportions of acid and phosphate as are usually used with Carolina rock. The rock deposit does not dry out so well when treated with acid, and might not be profitably used, as it takes a long time to dry, and then sets into a hard mass. Second, neither does the large percentage of iron and alumina cause the soluble phosphoric acid to revert, as I have analyzed samples of the acid phosphate two months after it was made, which contained an unusual percentage of soluble as compared to reverted phosphoric acid. I can only account for these injurious constituents not acting in their usual way by supposing that the presence of so much lime counteracts their presence. Third, this material yields a larger per cent. of "available" when treated with acid than Carolina rock does. One specimen of acid phosphate, made in the proportion of one thousand pounds of 50° B. acid to twelve hundred of the sun-dried marly deposit, and analyzed two months after it was made, yielded 17 per cent. of "available," (of which 14 per cent. was soluble,) with 2½ per cent. insoluble. Another sample by a similar formula yielded two days after it was made 18 per cent. of available, with 2 7-10 per cent. of insoluble.

The mining and preparation for market of this material would be a simple and inexpensive process, as it occurs exactly like a clay bank—a solid bed of soft material—which would simply have to be shovelled up and brought to the surface. It would then have to be dried either by the sun or artificially on the large scale, probably by means of steam-heated cylinders, such as are used in Chicago establishments to dry tankage, etc. This would finish its preparation as far as the miners are concerned. The final process, the grinding, would interest the manufacturer and might give ours some trouble at first, as, although the material is perfectly soft and friable and contains very few lumps, it is perfectly "dead" when struck, and

the fine particles have no "slickness" about them. For this reason it would probably clog a Lucoy mill or buhr-stone unless it was very dry. However, simply passing the very dry stuff through rollers might be sufficient, as it is in such a fine state of subdivision naturally, and soaks up acid so readily. The principal difficulty in mining would be drainage, as a portion of the deposit is in very low land, and in going down to such depths it would be necessary to have steam pumps and conduits for the waste water to the river. Taking all this into consideration, however, it could be mined for a great deal less than Carolina rock, because in the first place when a cubic yard was thrown out, it would be a cubic yard of pure phosphate, whereas in Carolina this constitutes but a comparatively small percentage. Secondly, the actual cost of getting down to the material would be nothing like so great, as not one-hundredth part of the surface earth would have to be thrown off in proportion to the phosphate mined. The drainage would probably not be more than on some of our lands. The drying should not cost more. There would be no washing. And, lastly, the grinding and crushing, after we learned how to do it, would have to be very much less.

As to transportation facilities, it would probably have to be shipped to Fernandina, which is a deep water port, one hundred and eighty-two miles distant. Or it might be lightered down the Withlacoochee River to the Gulf, but as the whole Gulf coast is very shoaly it would probably only be practicable for sailing vessels to get up to the mouth.

Of the other deposits in Florida, that on the Alafia River is being worked by an Atlanta company. There seems to be some doubt about its value, however, and I suspect that it is in too small quantities. Those on Tenacea Island and the adjacent mainland consist of low

grade sandstone and fossil bones, and are not in sufficient quantity to warrant mining.

The deposits around Charlotte's Harbor appear to be very valuable. Geo. W. Scott, of Atlanta, with whom are associated several New York parties, own between five and six thousand acres of selected phosphate land, which was bought for very little, before the presence of phosphates was suspected. The company has been involved in a law suit from its formation, and an injunction served on Mr. Scott by one of the partners has prevented any work being done. Now, however, the objectionable partner has lately been bought out for a round sum (considering that he only owned a one-sixth interest), and we may expect developments on an extensive scale very shortly. All the mining that has so far been done in this locality has been done by a man named Morehead, who only owns some two hundred acres in the centre of Col. Scott's tract. All of it has been shipped by rail to Atlanta, and used by the Geo. W. Scott Manufacturing Company, who, from all accounts, are well pleased with it. Some of it runs very high, and all that I have ever seen runs over 60 per cent. It resembles Carolina rock more than any Florida phosphate, perhaps, but is in very much smaller nodules, and has a considerable portion of fossil bone in it.

The deposits on the Myakka River do not seem to be so valuable as those on the Peace River. From all I can hear there seems to be some good land to be bought in this section, however; i.e., on the Peace and Myakka rivers and Charlotte's Harbor.

Air-Compressing Machinery at Collieries.—Mr. J. Morison points out the danger attending the use of light material oils for

lubricating air-compressing machinery. On February 13, 1888, he examined at Newbattle Colliery Dalketh, the discharge pipes leading from an air-compressor to a receiver 50 feet away. The pipes were of cast iron, 6 inches inside diameter, and had flanged joints, the joints being made with india-rubber insertion screwed up between the flanges. The compressing cylinder was 24 inches in diameter by 4 feet stroke, and air was compressed up to 50 lbs. per square inch. The cylinder was fixed in a tank containing water, but no other method was used for cooling the air during compression. The temperature of the air leaving the compressor was found to vary between 320° and 370° F. when compressed up to 50 lbs. per square inch. The receiver was blown off daily. Some little time previously the pipes leading to the receiver appeared to be unusually hot, and soon two of the pipe joints between the cylinder and the receiver began to blow, while sparks were blowing with the air out of the joint, and the pipe was nearly red hot. On taking out the joints, they were found to be charred and burnt through, and the interior of the pipes was coated with a charred deposit, doubtless the residue of the combustion of lubricating oil which had been used in the cylinder. The oil ordinarily used was lard oil, but owing to a temporary want of this latter, for a short time previously use had been made of a mixture of heavy mineral oil (high flash-point) with an oil bought as colza. The supposed colza oil was chiefly made up of thickened cotton-seed oil and intermediate mineral; its specific gravity was 0.91, and it had a strong mineral bloom, and flashed at 295° F. The author compared the circumstances of the two cases, and concluded that the flash-point of all oil used in air-compressing machines should be tested, or a guarantee should be obtained from the maker.

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For further information see OFFICIAL POSTAL GUIDE.

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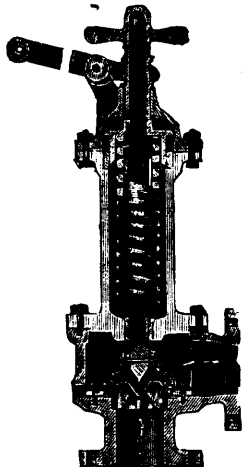
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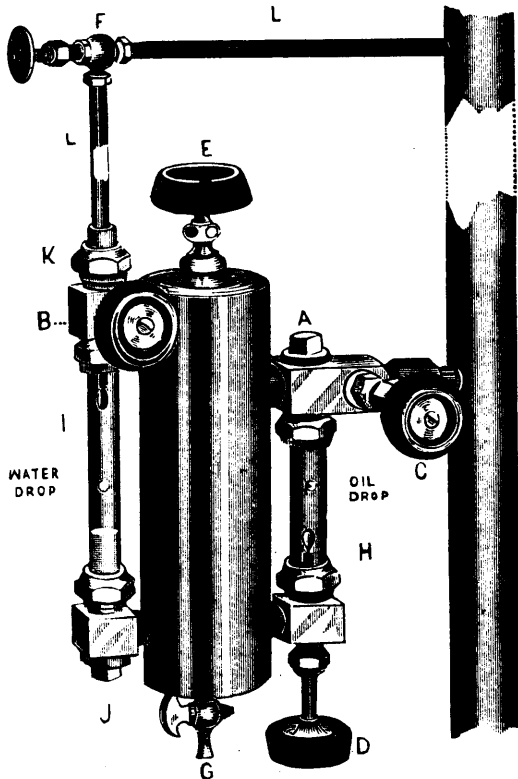
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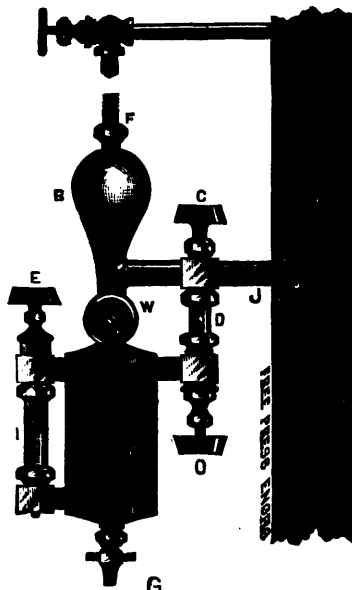
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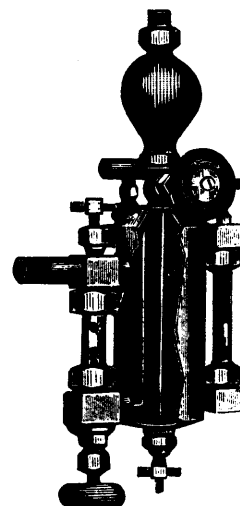
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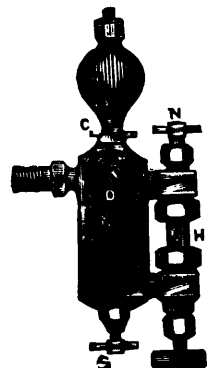
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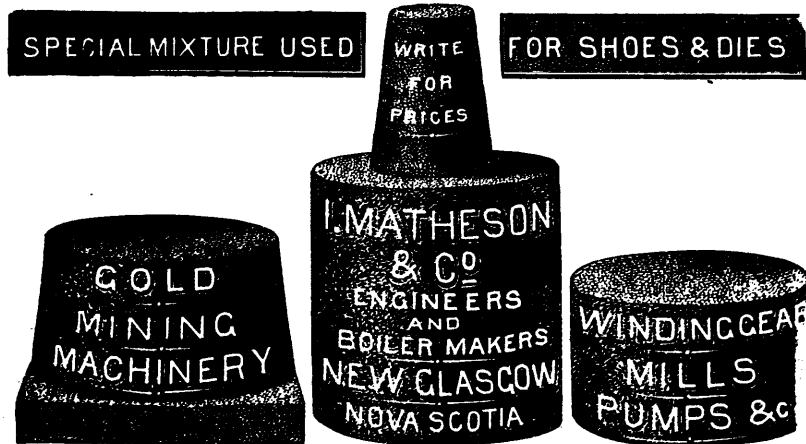
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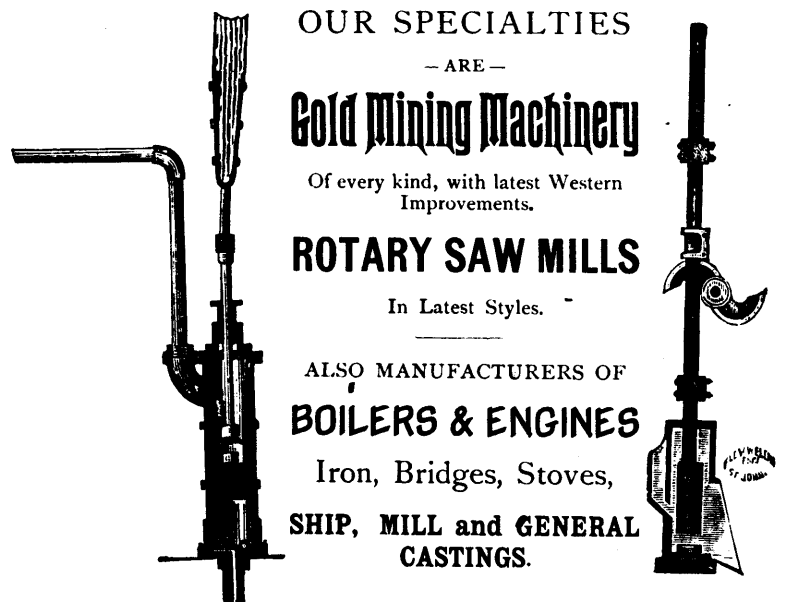
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DEPARTMENT
OF
Inland Revenue.

AN ACT RESPECTING AGRICULTURAL FERTILIZERS.

The public is hereby notified that the provisions of the Act respecting AGRICULTURAL FERTILIZERS came into force on the 1st of January, 1886 and that all Fertilizers sold thereafter require to be sold subject to the conditions and restrictions therein contained—the main features of which are as follows:

The expression "fertilizer" means and includes all fertilizers which are sold at more than TEN DOLLARS per ton, and which contains ammonia, or its equivalent of nitrogen, or phosphoric acid.

Every manufacturer or importer of fertilizers for sale, shall, in the course of the month of January in each year, and before offering the same fertilizer for sale, transmit to the Minister of Inland Revenue, carriage paid, a sealed glass jar, containing at least two pounds of the fertilizer manufactured or imported by him, with the certificate of analysis of the same, together with an affidavit setting forth that each jar contains a fair average sample of the fertilizer manufactured or imported by him; and such sample shall be preserved by the

Minister of Inland Revenue for the purpose of comparison with any sample of fertilizer which is obtained in the course of the twelve months then next ensuing from such manufacturer or importer, or collected under the provisions of the Adulteration Act, or is transmitted to the chief analyst for analysis.

If the fertilizer is put up in packages, every such package intended for sale or distribution within Canada shall have the manufacturer's certificate of analysis placed upon or securely attached to each package by the manufacturer; if the fertilizer is in bags, it shall be distinctly stamped or printed upon each bag; if it is in barrels, it shall be either branded, stamped or printed upon the head of each barrel or distinctly printed upon good paper and securely pasted upon the head of each barrel, or upon a tag securely attached to the head of each barrel; if it is in bulk, the manufacturer's certificate shall be produced and a copy given to each purchaser.

No fertilizer shall be sold or offered or exposed for sale unless a certificate of analysis and sample of the same shall have been transmitted to the Minister of Inland Revenue and the provisions of the foregoing sub-section have been complied with.

Every person who sells or offers or exposes for sale any fertilizer, in respect of which the provisions of this Act have not been complied with—or who permits a certificate of analysis to be attached to any package, bag or barrel of such fertilizer, or to be produced to the inspectors to accompany the bill of inspection of such inspector stating that the fertilizer contains a larger percentage of the constituents mentioned in sub-section No. 11 of the Act than is contained therein—or who sells, offers or exposes for sale any fertilizer purporting to have been inspected, and which does not contain the percentage of constituents mentioned in the next preceding section—or who sells or offers or exposes for sale any fertilizer which does not contain the per-

centage of constituents mentioned in the manufacturer's certificate accompanying the same, shall be liable in each case to a penalty not exceeding fifty dollars for the first offence, and for each subsequent offence to a penalty not exceeding one hundred dollars. Provided always that deficiency of one per centum of the ammonia, or its equivalent of nitrogen, or of the phosphoric acid, claimed to be contained, shall not be considered as evidence of fraudulent intent.

The Act passed in the forty-seventh year of Her Majesty's reign, chaptered thirty-seven and entitled, "An Act to prevent fraud in the manufacture and sale of agricultural fertilizers," is by this Act repealed, except in regard to any offence committed against it or any prosecution or other act commenced and not concluded or completed, and any payment of money due in respect of any provision thereof.

A copy of the Act may be obtained upon application to the Department of Inland Revenue, as well as a copy of a Bulletin which it is proposed to issue in April, 1888, concerning the fertilizers

E. MIALL,
Commissioner.

January, 1889.

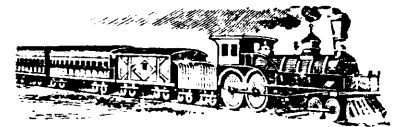


NOTICE

Is hereby given that all communications in respect to matters affecting the Department of Indian Affairs should be addressed to the Honorable E. Dewdney as Superintendent General of Indian Affairs, and not as Minister of the Interior, or to the undersigned. All Officers of the Department should address their official letters to the undersigned.

L. VANKOUGHNET,
Deputy Superintendent-General
of Indian Affairs.

Department of Indian Affairs,
Ottawa, 11th May, 1889.



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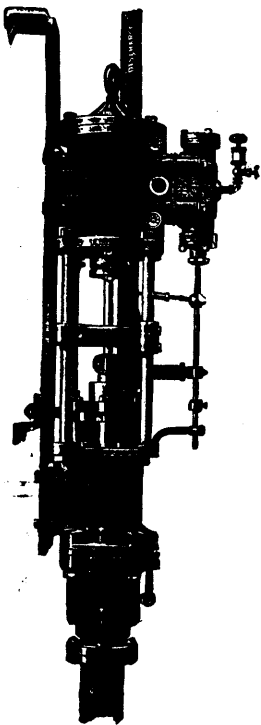
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Mining Regulations

TO GOVERN THE DISPOSAL OF

Mineral Lands other than Coal Lands, 1886.

THESE REGULATIONS shall be applicable to all Dominion Lands containing gold, silver, cinnabar, lead, tin, copper, petroleum, iron or other mineral deposits of economic value, with the exception of coal.

Any person may explore vacant Dominion Lands not appropriated or reserved by Government for other purposes, and may search therein, either by surface or subterranean prospecting for mineral deposits, with a view to obtaining under the Regulations a mining location for the same but no mining location or mining claim shall be granted until the discovery of the vein, lode or deposit of mineral or metal within the limits of the location or claim.

QUARTZ MINING

A location for mining, except for iron on veins, lodes or ledges of quartz or other rock in place, shall not exceed forty acres in area. Its length shall not be more than three times its breadth and its surface boundary shall be four straight lines, the opposite sides of which shall be parallel, except where prior locations would prevent, in which case it may be of such a shape as may be approved of by the Superintendent of Mining.

Any person having discovered a mineral deposit may obtain a mining location therefor, in the manner set forth in the Regulations which provides for the character of the survey and the marks necessary to designate the location on the ground.

When the location has been marked conformably to the requirements of the Regulations, the claimant shall within sixty days thereafter, file with the local agent in the Dominion Land Office for the district in which the location is situated, a declaration or oath setting forth the circumstances of his discovery, and describing, as nearly as may be, the locality and dimensions of the claim marked out by him as aforesaid; and shall, along with such declaration, pay to the said agent an entry fee of FIVE DOLLARS. The agent's receipt for such fee will be the claimant's authority to enter into possession of the location applied for.

At any time before the expiration of FIVE years from the date of his obtaining the agent's receipt it shall be open to the claimant to purchase the location on filing with the local agent proof that he has expended not less than FIVE HUNDRED DOLLARS in actual mining operations on the same; but the claimant is required, before the expiration of each of the five years, to prove that he has performed not less than ONE HUNDRED DOLLARS' worth of labor during the year in the actual development of his claim, and at the same time obtain a renewal of his location receipt, for which he is required to pay a fee of FIVE DOLLARS.

The price to be paid for a mining location shall be at the rate of FIVE DOLLARS PER ACRE, cash, and the sum of FIFTY DOLLARS extra for the survey of the same.

No more than one mining location shall be granted to any individual claimant upon the same lode or vein.

IRON.

The Minister of the Interior may grant a location for the mining of iron, not exceeding 160 acres in area which shall be bounded by north and south and east and west lines astronomically, and its breadth shall equal its length. Provided that should any person making an application purporting to be for the purpose of

mining iron thus obtain, whether in good faith or fraudulently, possession of a valuable mineral deposit other than iron, his right in such deposit shall be restricted to the area prescribed by the Regulations for other minerals, and the rest of the location shall revert to the Crown for such disposition as the Minister may direct.

The regulations also provide for the manner in which land may be acquired for milling purposes, reduction works or other works incidental to mining operations.

Locations taken up prior to this date may, until the 1st of August, 1886, be re-marked and re-entered in conformity with the Regulations without payment of new fees, in cases where no existing interests would thereby be prejudicially affected.

PLACER MINING.

The Regulations laid down in respect to quartz mining shall be applicable to placer mining as far as they relate to entries, entry fees, assignments, marking of localities, agents' receipts, and generally where they can be applied.

The nature and size of placer mining claims are provided for in the Regulations, including bar, dry, bench, creek or hill diggings, and the RIGHTS AND DUTIES OF MINERS are fully set forth.

The Regulations apply also to

BED-ROCK FLUMES, DRAINAGE OF MINES AND DITCHES.

The GENERAL PROVISIONS of the Regulations include the interpretation of expressions used therein; how disputes shall be heard and adjudicated upon; under what circumstances miners shall be entitled to absent themselves from their locations or diggings, etc., etc.

THE SCHEDULE OF MINING REGULATIONS

Contains the forms to be observed in the drawing up of all documents such as:— "Application and affidavit of discoverer of quartz mine." "Receipt for fee paid by applicant for mining location." "Receipt for fee on extension of time for purchase of a mining location." "Patent of a mining location." "Certificate of the assignment of a mining location." "Application for grant for placer mining and affidavit of applicant." "Grant for placer mining." "Certificate of the assignment of a placer mining claim." "Grant to a bed rock flume company." "Grant for drainage." "Grant of right to divert water and construct ditches."

Since the publication, in 1884, of the Mining Regulations to govern the disposal of Dominion Mineral Lands the same have been carefully and thoroughly revised with a view to ensure ample protection to the public interests, and at the same time to encourage the prospector and miner in order that the mineral resources may be made valuable by development.

COPIES OF THE REGULATIONS MAY BE OBTAINED UPON APPLICATION TO THE DEPARTMENT OF THE INTERIOR

A. M. BURGESS,

Deputy Minister of the Interior



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— AND —

PRECIOUS STONES.

Titles given direct from the Crown, Royalties & Rentals moderate

GOLD AND SILVER.

Under the provisions of chap. 7, Revised Statutes, of Mines and Minerals Licenses are issued for prospecting Gold and Silver for a term of six months, which can be extended by renewal for another six months. Mines of Gold and Silver are laid off in areas of 150 by 250 feet, any number of which up to one hundred can be included in one License, provided that the length of the block does not exceed twice its width. Up to ten areas the cost is 50 cents per area, for every area in addition in same application 25 cents. Cost of renewal one half the original fees. Leases of any number of areas are granted for a term of 21 years at \$2.00 per area. These leases are forfeitable if not worked, but advantage can be taken of a recent Act by which on payment of 50 cents annually for each area contained in the lease it becomes non-forfeitable if the labor be not performed.

Licenses are issued to owners of quartz crushing mills who are required to pay Royalty on all the Gold they extract at the rate of two per cent. on smelted Gold valued at \$19.00 an ounce, and in smelted Gold valued at \$18.00 an ounce.

Applications for Licenses or Leases are receivable at the office of the Commissioner of Public Works and Mines each week day from 10 a.m. to 4 p.m., except Saturday, when the hours are from 10 to 1. Licenses are issued in the order of application according to priority. If a person discovers Gold in any part of the Province he may stake out the boundaries of the area he desires to obtain, and this gives him one week and twenty-four hours for every 15 miles from Halifax in which to make application at the Department for his ground.

MINES OTHER THAN GOLD AND SILVER.

Licenses to search for twelve months are issued, at a cost of twenty dollars, for Minerals other than Gold and Silver, out of which one square mile can be selected for mining under lease. These leases are for four renewable terms of twenty years each. The cost for the first year is fifty dollars, and an annual rental of thirty dollars secures each lease from liability to forfeiture for non-working.

All rentals are refunded if afterwards the areas are worked and pay royalties. All titles, transfers, etc., of minerals are registered by the Mines Department free of charge, and provision is made for lessees and licensees whereby they can acquire promptly either by arrangement with the owner or by arbitration all land required for their mining works.

The Government as a security for the payment of royalties makes the royalties a first lien on the plant and fixtures of the mine.

The unusually generous conditions under which the Government of Nova Scotia grants its minerals have introduced many outside capitalists who have always stated that the Mining Laws of the Province were the best they had had experience of.

The royalties on the remaining minerals are:—Copper, four cents on every unit; Lead, two cents upon every unit; Iron, five cents on every ton; Tin and Precious Stones, five per cent.; Coal, 7½ cents on every ton sold.

The Gold district of the Province extends along its entire Atlantic coast and varies in width from 10 to 40 miles, and embraces an area of over three thousand miles, and is traversed by good roads and accessible at all points by water. Coal is known in the counties of Cumberland, Colchester, Pictou and Antigonish, and at numerous points in the island of Cape Breton. The ores of Iron, Copper, etc., are met at numerous points, and are being rapidly secured by miners and investors.

Copies of the Mining Law and any information can be had on application to

THE HON. C. E. CHURCH,

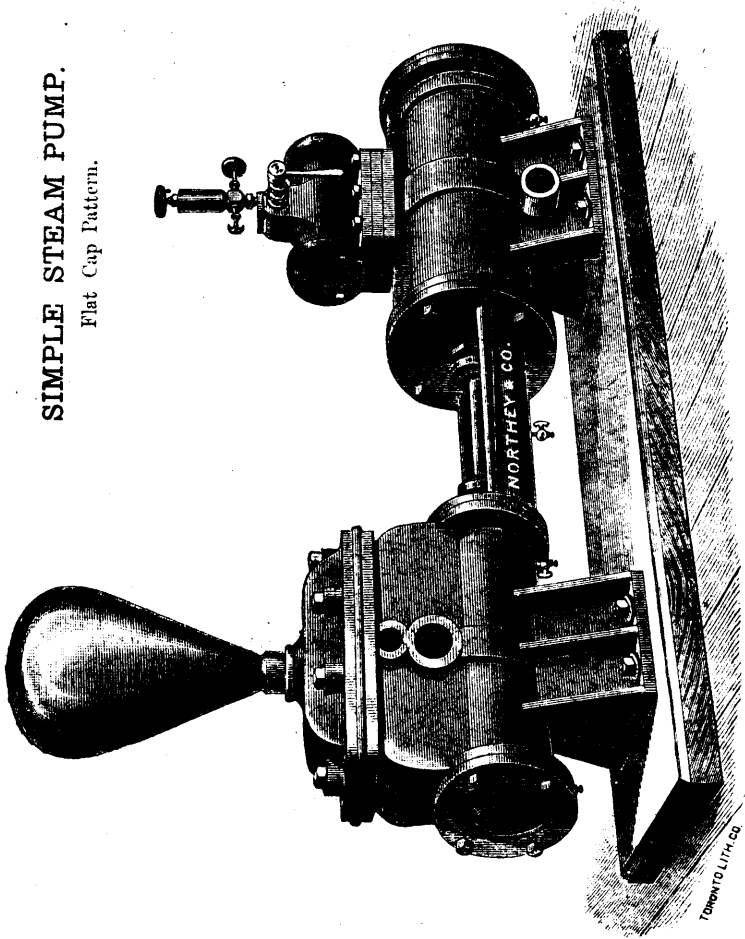
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HALIFAX,

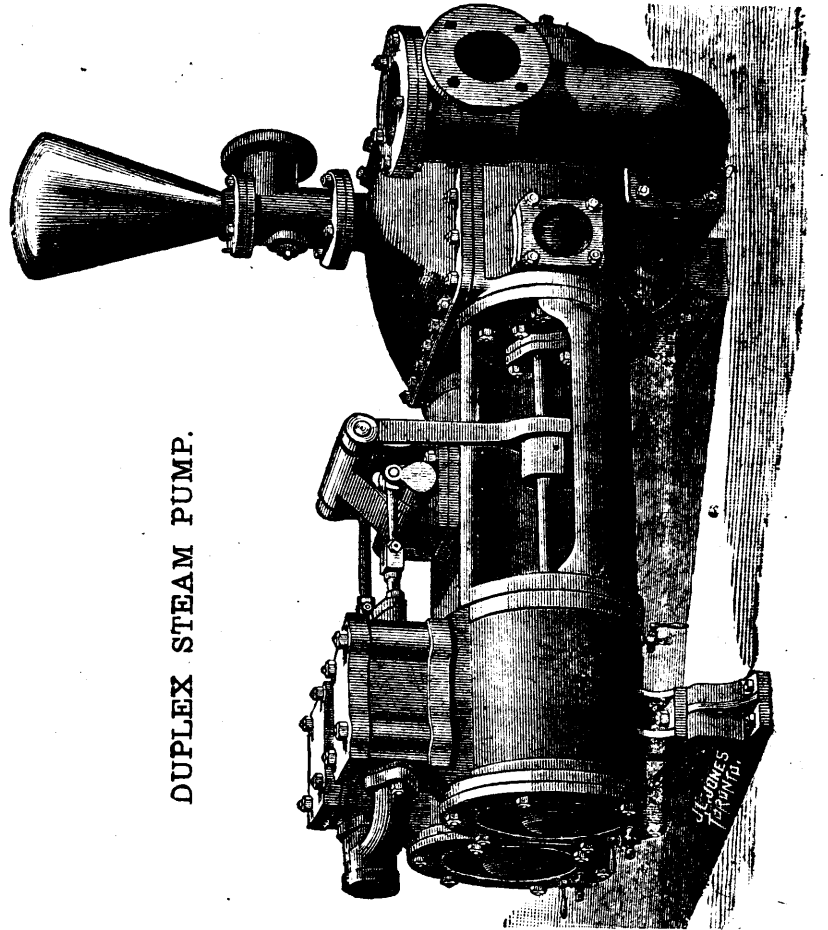
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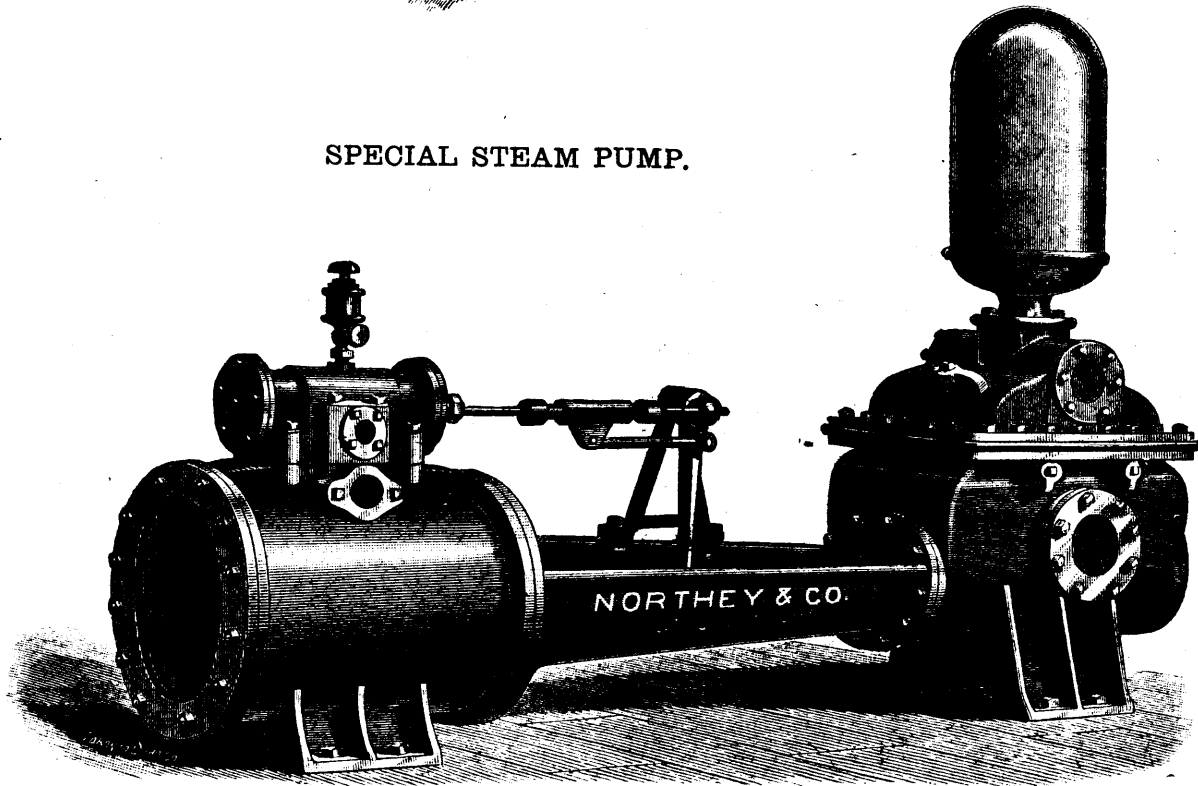
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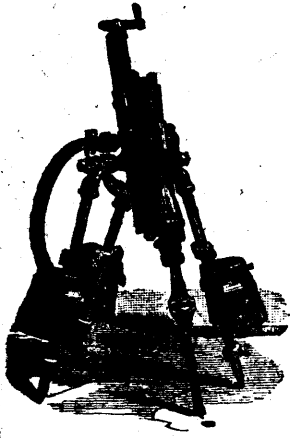


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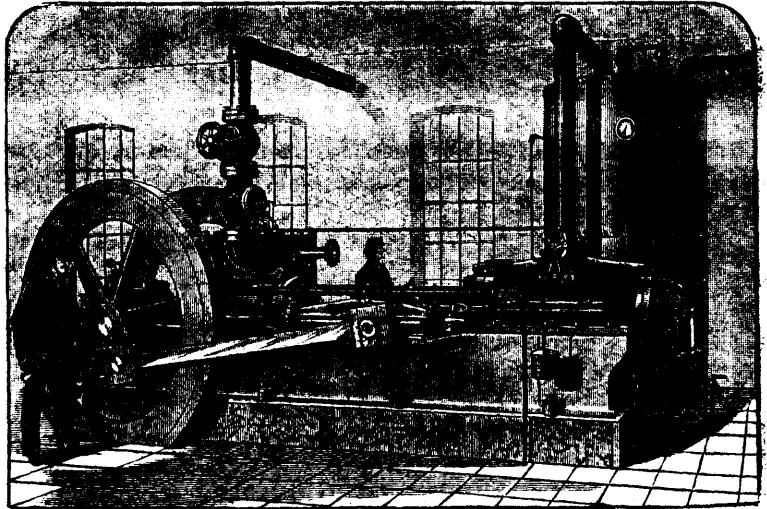
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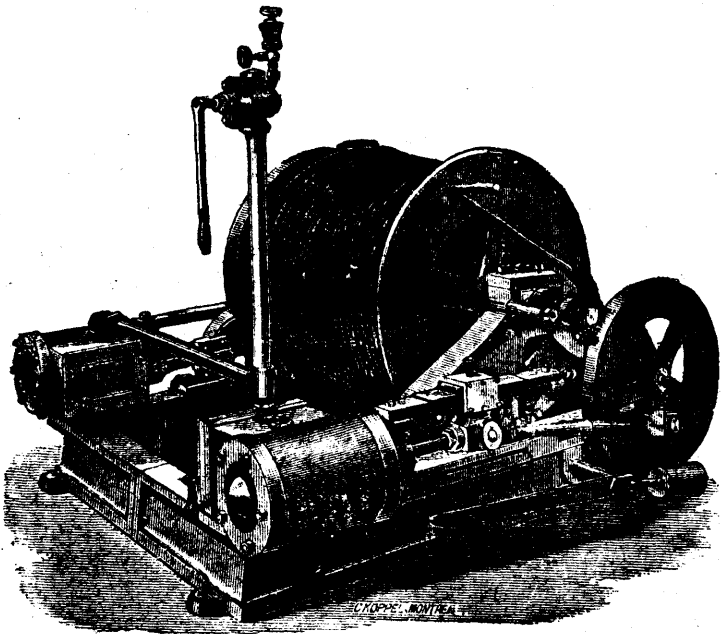


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